STEEL

PRODUCTION · PROCESSING · DISTRIBUTION · USE

For forty-eight years—IRON TRADE REVIEW

EDITORIAL STAFF

E. L. SHANER, *Editor*
E. C. BARRINGER, *Managing Editor*
E. C. KREUTZBERG, *Engineering Editor*

ASSOCIATE EDITORS

A. J. HAIN — E. F. ROSS
G. H. MANLOVE — J. D. KNOX
A. H. ALLEN

New York B. K. PRICE—L. E. BROWNE
Pittsburgh . . . E. A. FRANCE JR.
Chicago . . . . . W. G. GUDE
Washington . . . . . L. M. LAMM
London . . . . VINCENT DELPORT

Published by
PENTON PUBLISHING CO.
PENTON BUILDING
CLEVELAND, O.

JOHN A. PENTON, *Chairman of Board*
C. J. STARK . . . . . *President*
J. D. PEASE . . . *Vice President*
F. V. COLE . . . . . *Secretary*

BUSINESS STAFF

GEORGE O. HAYS, *Business Manager*

New York
J. F. AHRENS — E. W. KREUTZBERG
Pittsburgh . . . . S. H. JASPER
Chicago . . . . . L. C. PELOTT

Cleveland
JOHN HENRY — R. C. JAENKE

R. T. MASON, *Circulation Manager*

Contents . . September 24, 1934

Volume 95 ◆ Number 13

AS THE EDITOR VIEWS THE NEWS 21

NEWS OF THE WEEK:

New Deal Loses in Poll; President More Popular 22

Steel Code	23	Structural Code	25
NRA	24	Anniversaries	26
Labor	25	Washington	26
Transportation	25	Meetings	26
Foreign Trade	25	Production	26

Windows of Washington 27
Mirrors of Motordom 29
"Union Seeks to Create Hostility"—Girdler 31
Nonferrous Jobbers Discuss Code Costs 31
Here and There in Industry 32
Industry To Draft Legislative Plan 32
Obituaries 32
Industrial Men in the Day's News 33
EDITORIAL—Industry Is Amateur in Public Relations 34
THE BUSINESS TREND 35

ENGINEERING DEVELOPMENTS:

Industrial Realignments	37	Vending Machines	51
Low-Alloy Steels	41	Steelmaking Progress	52
Methods and Materials	46	A.I.S.E.E. Convention	54
Blown-Up Trademarks	48	Iron and Steel Exposition	60
View of Elastic Limit	48	New Equipment	63

PREVIEW OF NATIONAL METAL CONGRESS 74-118
MARKET REPORTS AND PRICES 127-152
CONSTRUCTION AND ENTERPRISE 149
ADVERTISING INDEX 158

NRA MEMBER U.S. WE DO OUR PART

BRANCH OFFICES:

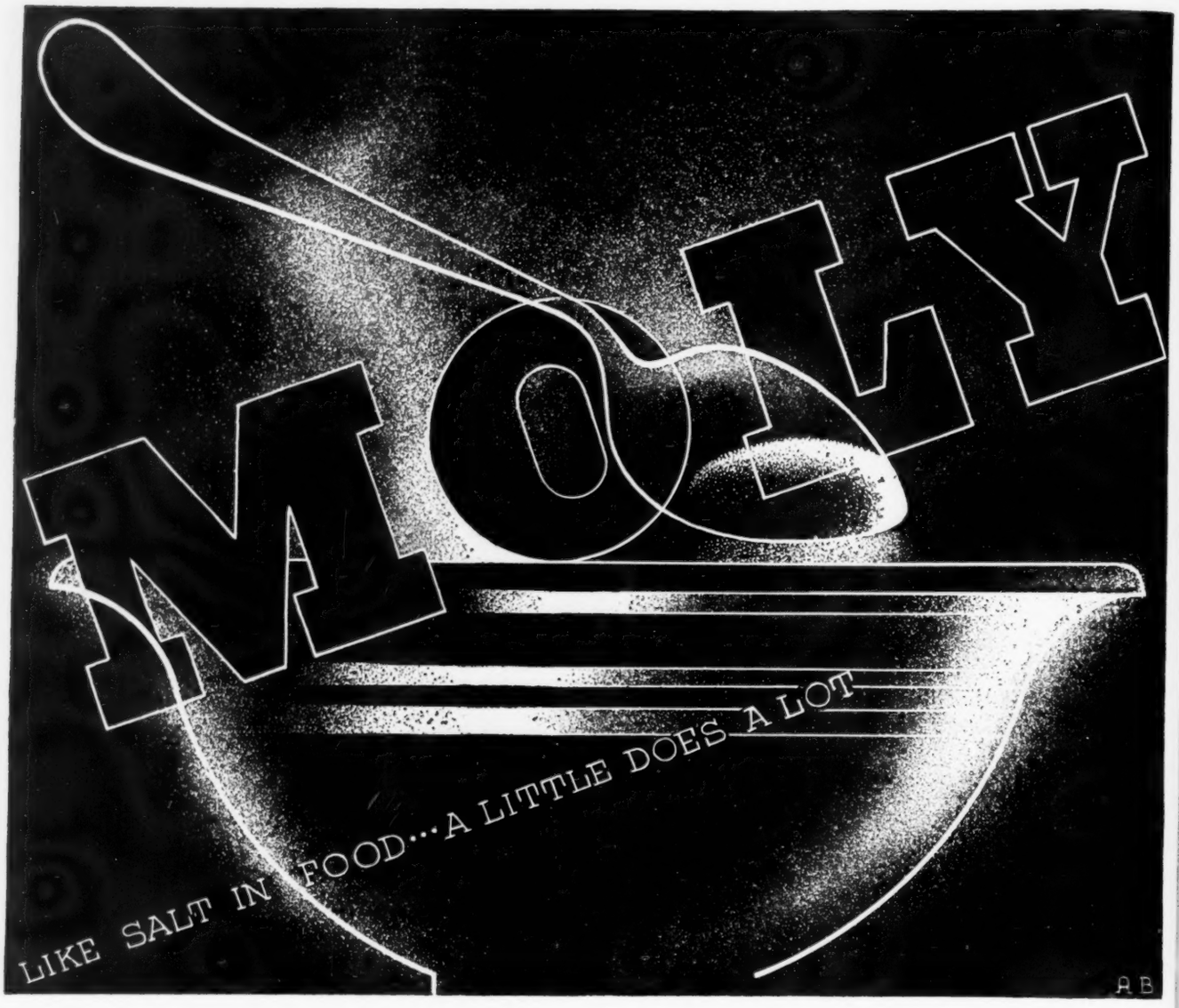
New York . . . . . **220 Broadway**
Chicago . . . . **Peoples Gas Building**
Pittsburgh . . . . . **Oliver Building**
San Francisco . . . . **441 Merrit Ave., Oakland, Calif., Tel. Holiday 4290**
Washington . . . **National Press Building**
Cincinnati . . . **418-420 Sinton Hotel**
London . . . . . **Caxton House Westminster, S. W. 1**
Berlin . . **Berlin, N. W. 40, Roonstrasse 10**

Member Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association.

Published every Monday. Subscription in the United States, Cuba and Mexico, one year $4, two years $6; in Canada one year $6.60, two years $11.20; in Great Britain and European countries, one year £2.

Entered as second class matter at postoffice at Cleveland under the Act of March 3, 1879.

Copyright 1934 by Penton Publishing Co.



AN INTERESTING example of what a lot of work a small amount of Molybdenum can do may be found in the following comparison of two steels:

	No. 1	No. 2
C	.28/.37%	.23/.30%
Mn	.30/.70	.30/.70
Cr	.65/1.35	.75/1.00
Ni	3.00/3.50	2.55/3.05
Mo	nil	.30/.50
Elastic Limit	116,700 p. s. i.	130,000 p. s. i.
Ult. Tens. Strength	135,200 p. s. i.	142,000 p. s. i.
Elong. % in 2"	19.6	20.5
Red. of Area %	57.1	65.0

Thus it will be seen that the addition of *less than one-half of one per cent* Molybdenum, with lower Nickel and Chrome, produced an increase of 13,000 lbs. in Elastic Limit and 7000 lbs. in Ultimate Strength. At the same time, Elongation was raised 1% and Reduction of Area 8%.

This is just one of various directions in which "*Moly Improves Steel and Iron*" (which is the title of a book we have recently printed for the benefit of executives and engineers). The cost of the small amount of "Moly" required is in distinctly profitable relation to the results achieved.

Our new house-organ, "*The Moly Matrix*," enables you to keep up to date in the progress of Molybdenum. Ask to be put on our mailing-list. Write also for these interesting new books: "*Molybdenum in* 1934" and "*Molybdenum in Cast Iron* — 1934 *Supplement.*" If you have an alloy problem, let our metallurgists and modern experimental laboratory in Detroit help you. Climax Molybdenum Company, 295 Madison Avenue, New York.

Visit our booth, No. 108, at the International Foundry Congress, Phila., October 22-26

CLIMAX Mo-lyb-den-um

As the Editor Views the News

LAST week STEEL had an opportunity to check the opinions of iron and steel plant engineering and operating officials on the policies of the present government administration. The results of the poll (p. 22) show a remarkable shift in sentiment regarding the new deal. While 73 per cent of the voters favored it in the early days of the Roosevelt administration, today 54 per cent do not favor it. Slight majorities registered the opinion that the new deal and NRA have harmed rather than helped. The poll also indicates that the voters are more favorable to President Roosevelt than they are to his policies.

• • •

Readers should understand clearly that this surprising vote was not cast by chief executives. It represents the views of the superintendents, foremen, engineers, sales managers, etc. Rather than reflecting the attitude of so-called employers or captains of industry, it reveals the views of salaried employes—the second lieutenants and non-commissioned officers of industry. We believe the vote of this group strikes a fair average; a poll of company presidents would show a stronger anti-new deal vote, while the ballots of wage earners probably would reflect a heavy majority for the new deal.

Is Vote of "Non-Coms"

• • •

While it is known that Donald Richberg has voiced constructive criticism of the steel code at various times, his severe public condemnation of it last Wednesday before the Baltimore Advertising club (p. 24) is something of a surprise. Mr. Richberg asked, rather peevishly, why critics of codes and their administration do not criticize the "business men who wrote the codes and set up bureaucracies for their administration." This infers that industries enjoyed a free hand in writing their codes. Anyone familiar with the circumstances which attended the preparation and approval of most of the codes knows that the government used every weapon from mild persuasion to brutal dictation. We cannot believe that Mr. Richberg meant to say that the government now should disown its part in President Roosevelt's "partnership with business" and leave industry holding the bag.

Who Holds the Bag?

• • •

It seems increasingly difficult to impress Washington with the true situation in industry in its relation to the administration of NRA. Administrators do not seem to realize the extent to which lack of definite policy, lack of continuing authority among NRA officials, terrific turnover in NRA personnel and general inefficiency make it almost impossible for a code authority to work with NRA. If Mr. Richberg will take time to look into the correspondence of any typical code authority (not of the large industries) he will find evidence of NRA neglect, ignorance, buck-passing, etc. to the extent that he himself will wonder how industry can stand it. Industry is not criticizing NRA as much as it is pleading for NRA to get down to earth so that it can function.

NRA Still Up in Air

• • •

Tom M. Girdler, speaking before the iron and steel electrical engineers Tuesday (p. 31), performed a real service to industry by calling attention to the provisions in the British trade disputes and trade unions act which make it illegal in England for strikers to intimidate workers by force and violence. True to its tradition of law and order, England tries to avoid writing laws, which, like our Section 7a, breed strife and bloodshed while breathing the spirit of justice and harmony. The present arrogance of professional labor in the United States calls for restrictions which will make the unions and their officers responsible for their acts. This is no more than simple justice, and it would discourage much of the injury and destruction now rampant throughout the country.

Holds Unions Responsible!

E. L. Shaner

New Deal Loses in Steel Poll; President's Popularity Grows

A SECRET poll conducted by STEEL at the annual convention and exposition of the Association of Iron and Steel Electrical Engineers in Cleveland, Sept. 18-20, to sound out the economic and political sentiment of the iron and steel industry indicates:

An impressive reversal of opinion concerning the new deal, a 3 to 1 approval of it last year having been converted into a 5 to 4 opposition.

Practically an even division of sentiment whether the new deal has been personally helpful or harmful, but with a slight trend to the latter view.

A moderate majority convinced that NRA has been injurious to industry and recovery.

A noteworthy gain in the President's personal popularity, although former President Hoover maintains a slight edge.

Approximately 600 persons attending the convention and exposition in the Cleveland public auditorium participated in this poll by STEEL. Salaried employes of the industry predominated, with top executives and wage earners distinctly in the minority, as evidenced by the following analysis of a vote by occupations:

Engineers, 34 per cent; superintendents, foremen, etc., 25 per cent; skilled workers (welders, inspectors, machinists, electricians, etc.) 15 per cent; sales managers, district sales representatives, etc., 15 per cent; miscellaneous, 6 per cent; and chief executives (presidents, vice presidents, etc.) 5 per cent.

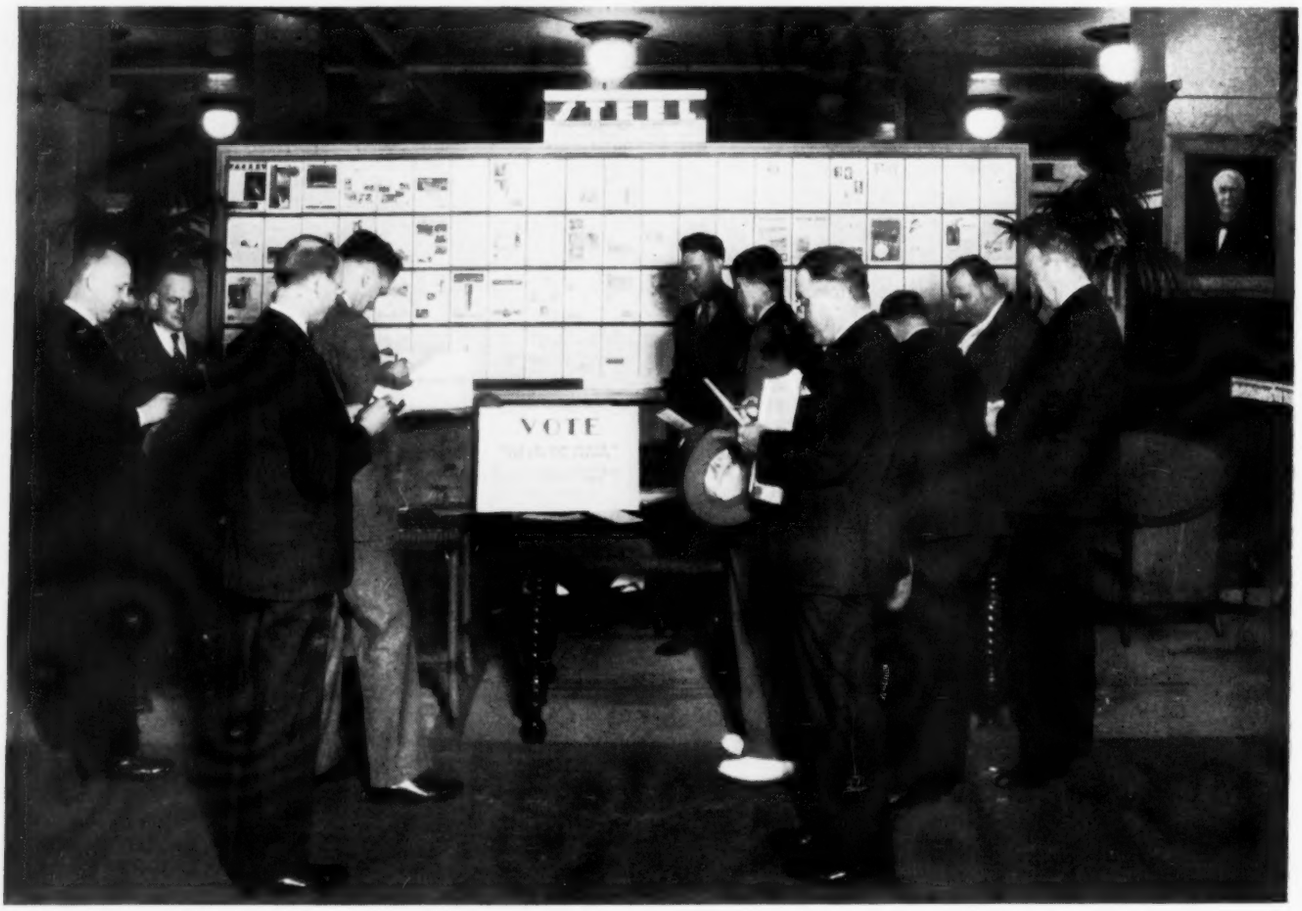
As indicated on the ballot reproduced on the opposite page, 458, or 73 per cent of those voting, were favorable to the new deal in the early days of the Roosevelt administration, compared with only 163 in opposition. But today, sentiment is 340 opposed, compared with 282 still approving it.

The favorable percentage of 73 a year ago is reduced to 46 at present. Or, in other words, a 3 to 1 approval a year ago has been reversed to a 5 to 4 antagonism.

It was a horse race whether the new deal had harmed or helped personally those voting, the division being 298 harmed to 280 helped.

On the question of NRA being beneficial or injurious to the employers of those voting, 311 were apprehensive of its results and only 264 were convinced it had expedited recovery.

So far as the iron and steel industry is concerned, the popularity of the President himself appears to be something apart from his policies. The 1932 vote of those taking part in STEEL'S poll was 207 for President



The voting was brisk Thursday evening when this photograph of STEEL'S *booth at the exposition of the Association of Iron and Steel Electrical Engineers in the Cleveland public auditorium was taken. The poll on the President, the new deal and NRA was as individual as if conducted in a regular election. The Australian ballot, as shown on page 23, was used. Note that Thomas Edison, at the extreme right, looks down approvingly*

Roosevelt, 412 for former President Hoover, 17 for Norman Thomas, socialist nominee, and 1 for William Z. Foster, communist.

Today, President Roosevelt would poll 280 votes, an increase of 73, while Mr. Hoover would fall back 98 votes to 314. Scattered votes would give Mr. Thomas 24, and Mr. Foster 3. Despite this large loss, Mr. Hoover today would have a clear majority of 7 over the field.

Extreme care was exercised by STEEL to insure a secret ballot and a fair cross section of opinion at the convention and exposition, the objective being to ascertain the sentiment of salaried executives rather than the extreme top or bottom strata of the personnel of the industry.

Facsimile of Ballot Used, and the Result

STEEL'S

Australian Ballot on the New Deal

Indicate Your Answer by Marking X in spaces provided

1. In 1932 I voted for: Roosevelt ☐ — 207
   Hoover ☐ — 412
   Thomas ☐ — 17
   Foster ☐ — 1

2. Had I known then what I know today I would have voted for: Roosevelt ☐ — 280
   Hoover ☐ — 314
   Thomas ☐ — 24
   Foster ☐ — 3

3. From March 4, 1933 and for months afterward (i.e., in the early days of the present administration) I favored ☐ the New Deal. — 458
   I did not favor ☐ the New Deal. — 163

4. Today I favor ☐ the New Deal. — 282
   Today I do not favor ☐ the New Deal. — 340

5. In my opinion, the New Deal has helped ☐ me personally. — 280
   In my opinion, the New Deal has harmed ☐ me personally. — 298

6. In my opinion, NRA has helped ☐ — 264
   In my opinion, NRA has harmed ☐ — 311
   the company (or other organization) with which I am identified.

Name .....

Position or title .....

Company or organization .....

Street address .....

City & state .....

Detach this from Ballot. Deposit Ballot and Signature in Separate Boxes provided.

Steel Code

AMERICAN Iron and Steel institute, the NRA steel code authority, is caught between two fires on the matter of quantity differentials on steel plates and shapes sold by producers in lots of 6000 pounds and less.

Made effective Oct. 1, in order to remove mill competition from a field which some warehouses believe is theirs, so great a protest was lodged by some structural fabricators that the effective date was postponed until Jan. 1. Quantity extras on steel bars, meanwhile, go into effect Oct. 1.

Suspension of the shape and plate extras precipitated a storm from warehouse interests, with the result a protest was filed with NRA.

Fabricators who protested the new extras contended that it was impossible to detail the costs of construction jobs in advance and also to ascertain how many small pieces requiring extras would be needed until work on project got underway.

PRICE STRUCTURE SENSITIVE

Iron and steel prices have been in delicate balance the past week. A Cleveland producer of iron gave notice it would file a price of $16.25, or $2.25 under the market, presumably following receipt of a large automotive inquiry, but withdrew it immediately. The understanding in the trade is that no iron was sold.

Reports are current that the practice of slitting cold rolled sheets into narrow widths and substituting them for cold rolled strip will result in special reductions in cold strip to automotive buyers.

¶An amendment to commercial resolution A7, effective Sept. 20, names Kentucky as well as California and North Carolina as a state in which deductions are permitted in base prices of products sold in intrastate commerce to the amount of the state sales tax.

¶Commercial resolution A5 has been amended to allow deductions, equivalent to such increases as may be made effective, in the extras as well as in the base prices of such products sold for an identified construction project, the deductions to hold good for 60 days after the beginning of a calendar quarter year for which there shall be an increase.

¶Regulations 1, as amended, relates to deductions allowed to jobbers of products other than those covered by amended Regulations 3, and by Regulations 5, 6, 7 and 8.

Certain changes in the phraseology of the definition of a jobber appear to have been made with the view to protecting the producer, where it was evident he acted in good faith in signing an agreement with a jobber who erred in stating his status or in some other respect failed in the fulfillment of his agreement. However, it does

not relieve the producer from the responsibility of making a reasonably thorough investigation of the status of a prospective jobber customer.

These revised regulations and also the new regulations 7 and 8 will make necessary the signing of new jobber agreements prior to Nov. 1.

¶Regulation 9, which probably will be promulgated this week, will compel fabricators to submit actual railroad bills of lading on material for unidentified structures before receiving final rate adjustments under fabrication-in-transit privilege. This is a partial revival of the earmarking controversy which developed several months ago.

Durable Goods

MEETING at Hot Springs, Va., Sept. 14 and 15, the durable goods industries committee, formed at the request of President Roosevelt and NRA Administrator Johnson following the general code conference in Washington March 5, completely reorganized as a body independent of any government connection.

With practically no change in personnel, but entirely as an independent body, the committee now consists of Charles R. Hook, American Rolling Mill Co., Middletown, O.; F. A. Lorenz Jr., American Steel Foundries, Chicago; Robert R. Fauntleroy, Moline Malleable Iron Co., St. Charles, Ill.; George P. Torrence, Link-Belt Co., Chicago; F. R. Hoadley, Farrel-Birmingham Co., Ansonia, Conn.; C. R. Messinger, Oliver Farm Equipment, Chicago; James W. Hook, Geometric Tool Co., New Haven, Conn.; George H. Houston, Baldwin Locomotive Works, Philadelphia; J. S. Tritle, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; H. Gerrish Smith, National Council of American Shipbuilders, New York; Harry S. Kimball, Fabricated Metal Products Industry, Washington; and Walter J. Kohler, Kohler Co., Kohler, Wis.

HOUSTON IS CHAIRMAN

Of this new committee, Mr. Houston has been elected chairman, Mr. Hook vice chairman, and Mr. Kimball treasurer. An executive committee was formed consisting of the chairman, vice chairman and the chairmen of such standing committees as may later be appointed. A council to be made up of one member from each of the durable goods industries, each industry to make its own selection, will be appointed.

While there was a broad and intimate discussion of the new deal and the government's recovery efforts, no platform for industry was adopted and no official stand taken, despite newspaper reports to the contrary.

No Relief for These Pigs!

ASTOUNDED by the news that 105 farmers in Middlesex county, Massachusetts, were to receive an average of $3500 each for not raising pigs, H. T. Outwater, sales manager of the Mystic Iron Works, Boston, wrote an open letter to Secretary Wallace, pointing out that his company, being the owner of a million-dollar "sow" (a blast furnace), had been in the non-pig-raising business since August, 1931, and was equally deserving of a government check for the work it hadn't done. Of course Mr. Outwater explains, his company's pigs were iron pigs, but, if propagation had been allowed to continue at an uninterrupted rate for the past three years, some 10,500,000 iron pigs would have been born, equivalent, at the present price of pork, to approximately 1,050,000 of the live, squealing kind. "Pigs is pigs."—From Steel-ings, published by Hill-Chase & Co., Philadelphia.

NRA

DONALD R. RICHBERG, an administration member on the NRA steel code authority, former chief counsel for NRA and now executive director of the President's emergency council, severely criticized the steel code in an address Sept. 19, before the Baltimore advertising club. He said in part:

"Probably the longest, most detailed regulatory code that has been written is the steel code, with literally hundreds of pages of basic code and supplementary regulations.

"It was written almost entirely by the industry. It is administered with a minimum of public control. Its administration requires the expenditure of $500,000 annually, and a force of employes who, if established by the government, would be called a bureaucracy.

"Personally I do not believe that a host of such codes and such bureaucracies can be or should be made permanent. I believe profoundly in the wisdom of the process of codification, but I believe also that it must be simplified.

"But, if anyone desires to criticize the codes that have been written, and their administration, as being enmeshed in red tape and establishing bureaucracies, why, in the name of honesty, does he not criticize the business men who wrote the codes and set up bureaucracies for their administration?

"The national government offered to industry an opportunity of self-government and if the experiment needs revision, the principal difficulty does not lie in persuading the government to do the job, but in persuading the business men of the country to simplify these complicated mechanisms which they themselves devised."

HEARINGS SCHEDULED

On amendment to scrap code to place Missouri in the list of southern states, Oct. 2; on supplemental codes for the forgings and piston castings divisions of the aluminum industry, Oct. 3.

¶An order approving the code for the steel casting industry as the code for the manganese steel casting industry was approved Sept. 17. The order defines "manganese steel castings" to mean that group of steel castings known in the trade under the name and having a manganese content of not less than 10 per cent.

¶Thirteen members of the cast iron pressure pipe industry have been exempted from the wage and hour provisions of the gray iron foundry code, following a showing that gray iron castings made by them constituted only 65/100 of 1 per cent of their production.

ADMINISTRATION AUTHORITIES

Samuel E. Duff, Pittsburgh, on the open steel flooring manufacturing code; Allan J. Parrish on the reinforcing materials fabricating industry code.

¶Reinforcing materials fabricating industry has petitioned NRA for modification of its code. One amendment would revise the section covering the administration's right to disapprove or modify any action taken by the code authority by bringing this section more into line with other codes recently approved.

¶An order placing the wire reinforcing industry under the iron and steel code was issued Sept. 13. Basing points for the industry are established at Pittsburgh, Chicago, Anderson, Ind., and Pacific coast ports enumerated in schedule F of the steel code.

¶The steel plate code authority has asked NRA approval of uniform cost accounting method to be used in estimating costs below which sales are forbidden.

CODE AUTHORITY APPROVED

For secondary steel products warehousing trade: L. J. Caine, Caine Steel Co.; Donald McLough, Consolidated Steel Co.; Sol Friedman, Friedman Bros. & Co.; J. D. Finnegan, Hynes Steel Products Co.; L. E. Zurbach, L. E. Zurbach Steel Co.; J. D. Rogers, Morse-Rogers Steel Co., and J. Lavine, Union Steel & Supply Co.

¶Jack manufacturing: (subdivision of the machinery and allied products industry) E. J. Griffiths, Duff-Norton Mfg. Co., Pittsburgh; M. H. Bridge, Joyce-Gridland Co., Dayton, O.; F. W. Krickhan, Templeton, Kenley & Co. Ltd., Chicago; and H. M. Sloan, Buda Co., Harvey, Ill.

Labor

FOLLOWING up the national labor relation board's decision in the case of the Houde Engineering Corp., Buffalo, that employers can bargain solely with majorities, and refusal of Houde to accept this ruling, NRA Administrator Johnson last week ordered Houde to cease displaying the blue eagle. Houde officials refused to surrender their eagle.

Meanwhile, employer associations the country over were advising their members, as did the National Association of Manufacturers a week ago, to ignore this ruling until it was sustained at least in the lower courts. The decision was termed one of the most important ever in employer-employe relationships.

¶Walter J. Kohler, whose ideal labor relationship through the Kohler Co. at Kohler, Wis., was upset by labor agitators, is insisting on dealing with minority groups until section 7A of the recovery act is otherwise interpreted.

¶No action has yet been taken by the national steel labor relations board on an election at the Wheeling Steel Corp. plant at Portsmouth, O. A hearing on this was held several weeks ago.

¶In the Mahoning valley last week rumblings were heard that the Amalgamated Association of Iron, Steel and Tin Workers might revive the threat of the steel strike which faded June 15 when the President effected a settlement by promising selection of a steel labor board.

ONE PEACEFUL SETTLEMENT

¶Case involving the discharge of 11 employes by the Carboloy Co. Inc., Detroit, resulted in an amicable settlement last week when this, the first labor dispute heard by the Detroit regional labor board under its new "panel system," resulted in a compromise accepted by both parties.

It was charged that the company discriminated against the men because of their union membership, but the employes will be returned to work as soon as the company requires them.

¶Metalworking employment in 24 leading centers in August declined 1.8 per cent from July, but was the highest for that month since 1931, according to the National Metal Trades association. August's index of 67.1 compares with 68.4 in July, 60.5 in August, 1933, and 50.3 in August, 1932. Principal decreases last month were shown at automotive centers, while employment gains were recorded at Philadelphia, Pittsburgh, and the Tri-Cities.

¶Western Clock Co., Peru, Ill., claims a new safety record for its plant, having passed the old mark of 9,166,634 man-hours without an accident. This mark was held by the Old Hickory, Tenn., plant of E. I. du Pont de Nemours Co.

¶Colorado Fuel & Iron Co. iron ore mines at Sunshine, Wyo., which were employing 150 men three days a week, have been closed.

Transportation

ARMY engineers who recently heard new arguments on the proposal to canalize the Beaver and Mahoning rivers in order to provide the Youngstown district with a water outlet to the Ohio river are expected to report shortly and have the project, in event of approval, ready for submission to congress in January.

The proposed Miami-Maumee canal is no longer being advocated, its proponents favoring the Scioto-Sandusky route. The most active opposition to the Beaver-Mahoning project originates with proponents of the Allegheny river-French creek canal project.

¶Interstate commerce commission next Monday, Oct. 1, will open its hearing on a proposal of the railroads to increase freight rates (for iron and steel mostly 10 per cent, with a maximum of 2c per 100 pounds) in order to raise $170,000 annually.

¶Joseph B. Eastman, federal co-ordinator of transportation, in addressing the National Petroleum association at Atlantic City, N. J., Sept. 19, advocated reductions in rates, especially passenger, co-ordination of railroads, motor carriers and water carriers.

¶Ohio utilities commission has ordered the Pennsylvania railroad to reduce freight rates on billets from Canton to Massillon, O., from $1.89 to $1.51, and on bars from $1.64 to $1.51, on complaint of Republic Steel.

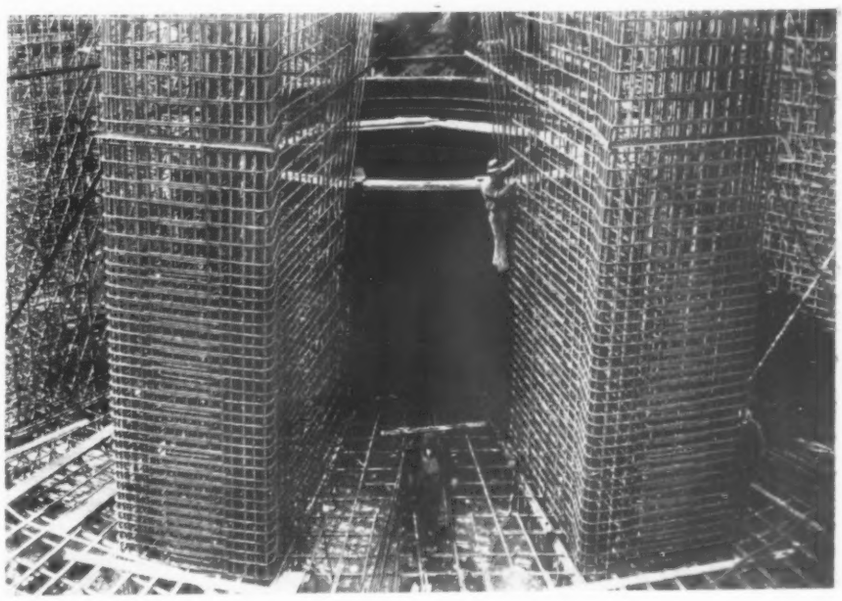
¶The Burlington railroad's stainless steel "Zephyr" train built by the Edward G. Budd Mfg. Co., Philadelphia, which has been on exhibition at the Century of Progress in Chicago, will be featured in an RKO film "The Silver Streak."

Foreign Trade

AUGUST imports of iron and steel products into the United States totaled 32,418 tons, almost double the 17,676 tons received in July, and second highest for any month this year. In eight months of 1934, imports have totaled 217,732 tons, compared with 251,894 tons in the comparable period of 1933, according to the iron and steel division, department of commerce.

Structural Code

MEMBERS of the NRA industrial advisory board will have a conference with General Johnson himself, prior to any definite action on the structural steel code, which has been held in abeyance since July 22 on account of objections of fabricators to inclusion of control over the erection of steel in the construction code. Some action is possible this



THIS NETWORK OF REINFORCING BARS illustrates the steel requirements for the Boulder dam project. There are four reinforced concrete towers, 342 feet high and 32 feet inside diameter, each of which contains two welded steel cylinder gates manufactured by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. For these four towers, 14,700,000 pounds of reinforcing steel was required, equivalent to 158 pounds of reinforcing steel for each cubic yard of concrete

week. The labor advisory board of NRA is contending for the code as revised unknown to the structural industry.

Anniversaries

CINCINNATI MILLING MACHINE CO. and Cincinnati Grinders Inc., Cincinnati, during the week of Oct. 8-13 inclusive, will celebrate the fiftieth anniversary of the founding of the Cincinnati Milling Machine Co., by setting aside this period as open house for its friends and customers and arranging an employes celebration.

Visitors will be shown a complete historical development of the company's products and the latest production methods and newest designs, some of the latter for the first time. A No. 6 centerless grinder, one of the largest centerless ever built, a 16 x 144-inch plain self-contained grinding machine, hydromatic milling machines and other equipment will be shown in operation.

Washington

TENNESSEE Valley Authority officials last week inaugurated a study of the possibilities of producing stainless steel in the South by use of the cheap power to be made available by the TVA development. Not only is cheap electric power expected to be an asset, but the development of a new market for stainless steel in the South also is visioned.

TVA recently completed a study of the possibilities of producing ferromanganese from domestic ore, also by the use of its cheap power. No public report is yet available.

¶Business advisory and planning council of the department of commerce held its sixth general meeting Sept. 20, receiving reports on a survey among small manufacturing industries on the extension of credit and from the industrial relations committee on unemployment insurance.

Meetings

INTERNATIONAL ACETYLENE ASSOCIATION, of which H. F. Reinhard, 30 East Forty-second street, New York, is secretary, will hold its annual meeting at the William Penn hotel, Pittsburgh, Nov. 14-16. Speakers who have already accepted include E. F. Blank, Jones & Laughlin Steel Corp.; Dr. George T. Baker, president, Carnegie ;Institute of Technology; Dean E. A. Holbrook, University of Pittsburgh; and Prof. J. A. Zimmerman, Massachusetts Institute of Technology.

The technical sessions of the convention will stress such important subjects as oxyacetylene cutting as applied to steel mill applications, the metallurgical aspects of the oxyacetylene welding process, pipe welding and testing, application of welding to the transportation industries, and education and safety in welding.

CHICAGO STEEL MEN TO GOLF

Steel Club of Chicago has arranged for its first annual golf tournament and banquet at the Olympia Fields Country club, Sept. 26. Many executives and buyers of steel in the Chicago district have been invited to attend, golf and participate in a banquet in the evening.

¶St. Louis Welding society will meet Oct. 5 at 8 p. m. in the plant of the Midwest Piping & Supply Co., St. Louis. Procedure control for welding operations will be explained and a number of interesting welding demonstrations made. Meeting has been arranged by F. C. Fantz, vice president of the Midwest company.

ADVERTISERS TALK RECOVERY

With 250 members in attendance, the National Industrial Advertisers' association met in twelfth annual convention in Cincinnati the past week. Plenty of latitude was available under the general theme, "Making the Most of Recovery Opportunities," for the addresses and round table discussions.

William E. McFee, of the American Rolling Mill Co., Middletown, O., president of the association, was in general charge of the convention. Many industries were represented on the program. Bennett Chapple, vice president of the American Rolling Mill Co., was one of those representing the steel industry. Herman Lind, general manager of the National Machine Tool Builders' association, discussed the NRA.

Production

STEELMAKING operations appear to be on the way back, having gained 2 more points last week to 22½ per cent, due largely to additional open hearths being put on. Gains were noted in all districts except Chicago, which reported a 2-point decline, and Detroit, which remained unchanged. Further increases are indicated this week in the Pittsburgh, Chicago and New England districts. Details for various districts follow:

Youngstown—Gained 2 points to 26 per cent last week and this rate is expected to hold starting this week.

Birmingham—Advanced 2 points to 25 per cent last week and will probably hold at this level through the remainder of the month. Resumption of operations of the rail mill at Ensley to run a few days in order to turn out 2000 tons of 130-pound rails for the Southern Railway system will not require any additional open hearth furnaces to be started up as the steel will be carted from the Fairfield works to Ensley.

Cleveland-Lorain—Up 10 points to 28 per cent, with National Tube Co., Lorain, operating six open hearths; Corrigan, McKinney Steel Co., three; and Otis Steel Co., two. These schedules are to continue this week. Corrigan, McKinney company also will continue in operation its bar mill, which resumed last week after a week's suspension.

New England—Up 3 points to 28 per cent last week, slightly below expectations. Starting this week, the rate will be at 31 per cent.

Chicago—A decrease of 2 points to 22 per cent last week will be more than offset this week, with two leading interests planning the lighting of additional open hearths. Blast furnace schedules are unchanged, 8 of 36 steelworks stacks being active.

Central eastern seaboard—Up 1 point to 17 per cent. Little change is expected this week. Steelmaking operations continue in excess of finishing operations.

Detroit—Steady at 77 per cent last week, with 13 out of 17 open-hearth furnaces in production. Some time shortly, possiby this week, a decline is looked for with the taking from the active list of some Ford Motor Co. furnaces.

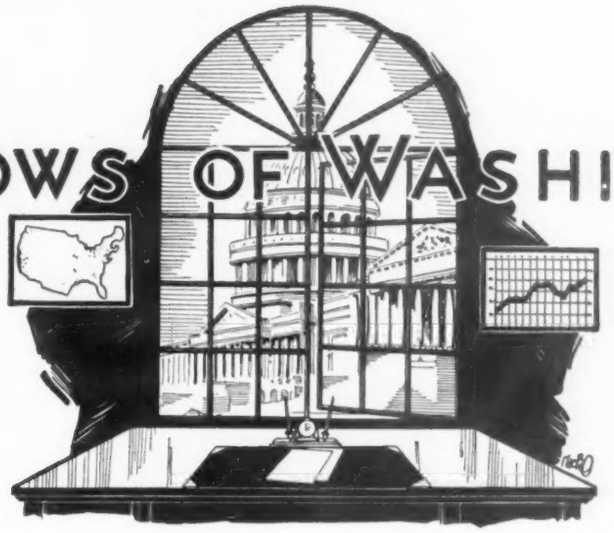
Wheeling—Advanced 3 points to 26 per cent, with 10 out of 39 furnaces on schedule. This is a net increase of one open-hearth active over a week ago. Each of the district producers has five open-hearth furnaces in operation.

Pittsburgh—Gained 3 points to 16 per cent last week, with a 1-point gain to 17 per cent schedule for this week. This improvement centers about the gain by a leading interest to over 20 per cent, and resumption of three open-hearth furnaces by a similar independent which had been closed since last July.

No changes occurred in the number of active blast furnaces, with 14 out of 60 steelworks furnaces in operation. Carnegie Steel Co. continues to operate 7 of 32; Jones & Laughlin Steel Corp., 2 of 11; Bethlehem Steel Co., 2 of 7, and National Tube Co., American Steel & Wire Co. and Pittsburgh Crucible Steel Co., 1 each.

Buffalo—District operations over last week ranged from 19 to 24 per cent, owing to changeovers, making the average for the week about 21 per cent. This is a gain of 2 points over the week previous. The rate is expected to advance to 24 per cent this week, with 9 out of 38 open hearths active.

WINDOWS OF WASHINGTON



WASHINGTON

THOSE who designated last week Constitution Week in commemoration of the 147th anniversary of the signing of that historic document and have found it easy to compare the constitution's guarantees of liberty with the regimentation of the new deal may have been inspired beyond their knowledge.

With the incorrigible optimism to which reference was made here a week ago, industry professes to read into last week's developments more indications of a turn to the right, either voluntary or enforced, than in any week of the Roosevelt administration thus far.

The skeptics contend that these events run true to form with Rooseveltian policy. Whenever the opposition accumulates enough pressure to force open another crater, there is a showing of conservatism which is momentarily heartening.

In the past it has invariably developed that there has been no important deviation from the social reform objectives of the new deal, and optimism has quickly died. It remains to be seen whether last week's veering was merely another series of concessions or a basic change. Only time can determine that.

JITTERY OVER BOND LAPSE

In any event, there is a widespread conviction that the weakness in government bonds early in September threw the worst scare yet into the administration, and that it then experienced a case of jitters comparable to that felt by the business community in the dark days of March, 1933, during and immediately after the bank holiday.

As some one has aptly said, the banks have become warehouses for government bonds. Their idle reserves approximate two billion dollars. They have been cold to the program for refunding bonds Oct. 15 and some appear to prefer still greater liquidity to continuing such large holders of bonds or increasing their investments in them.

Only ten days ago the chamber of commerce of the United States charged the treasury with draining banks of funds which otherwise would have been employed by industry. Talk of a central bank, which Democrats themselves jettisoned in Andrew Jackson's time, may be a little pressure on the banks to change their tune on bonds and refunding.

At least the administration appears to have learned that the banks have reached the resistance point, and the past week has spread fiscal assurance. Bank examiners indicate they will be more lenient, which, if true, means a decided loosening of bank credit for industry. RFC representatives have again scrutinized applications for loans, and intimate a more liberal policy will be followed. These events must forerun the lifting of the embargo on private capital, which is the basic formula for recovery.

LABOR TROUBLES ENDING?

If the textile strikers are beaten, as seems probable, the back of labor troubles may have been broken. It is assumed that impetuous as General Johnson is, he would not have charged that the textile workers broke faith with the government had he not backing from higher up.

The general's blast at the American Federation of Labor and his advocacy of vertical unions—which employe representation plans really are under company auspices—may have been designed to assure industry.

The explanation that the Frazier-Lemke farm moratorium act was not really an administration measure and was signed by the President with reservations follows the decision of Federal Judge Chestnut at Baltimore that the act violates the rights of creditors under the 14th amendment to the constitution, seeks to supersede the right of state courts, and hence is unconstitutional.

This is the most damaging blow the new deal has yet sustained in the courts, and it needs to be remembered that NRA, for one, has avoided bringing actions in courts where previous decisions indicated a lack of sympathy. The railroad pension act, which was a companion of the Frazier-Lemke law in being rushed through congress during an off moment, is also in the courts.

In Missouri, a state judge held last week that PWA was unconstitutional in that it had no authority to appropriate funds for purely intrastate projects. Coming on the heels of the blow to the moratorium act, this made last week a low point for the new deal in the courts.

When influential southern senators met in Washington Wednesday to request the President to suspend the Bankhead cotton restriction act a high water mark of opposition within the Democratic party was reached. Intimations emanated from the administration that it would be glad for a loophole through which to escape from much crop limitation.

Meanwhile, in NRA the state of confusion and inactivity continued. The steel code was under its most severe strain last week when a Cleveland producer of pig iron, presumably in response to an automobile manufacturer's inquiry for pig iron, planned to drop the market $2.25 but withdrew before making any sale.

PRICE PACTS CREAKING

Withdrawal of quantity extras on plates and shapes raised a storm, especially from eastern warehouse interests, while a sharp reduction in cold-rolled strip prices was threatened. An adjustment in some wire products prices also failed to mature recently by a narrow margin. These manifestations have not affected the market, but are indications that the code is skating on thin ice.

There has been no dearth of predictions that prior to the November election important shifts to the right would be made at Washington. Then

followed the Maine election, with persons whose opinions are generally sound maintaining that such concessions are not necessary at this time and could be withheld, without jeopardizing the election, until next year.

Now, in the past few days, the extent to which the weak bond market and the threat to government credit impressed the administration is appearing.

THE third and apparently the most attractive opportunity under the new deal for the steel industry to promote, virtually at government expense, greater use of steel in the home is opening up through the industries division of the new federal housing administration (FHA).

Granting that previous attempts by the government to stimulate industry have not been overly encouraging and that PWA and the subsistence homestead projects (the first two opportunities) have proved disappointing from the standpoint of energizing housing and creating demand for steel products, it looks to many as if FHA can be developed into the real thing—provided the industry co-operates.

HAS BULGING PURSE

Unlike other government agencies, FHA has a maximum of business men—its administrator is from Standard Oil and its deputy administrator from General Motors—and a minimum of theorists. It is saying frankly and unashamedly that, in addition to making jobs, its objective is to help industries affiliated with building to make money.

FHA has unlimited funds—if upward of two billion can be called that. More than 7000 banks are co-operating in making loans, both for modernization and new construction, which are virtually being underwritten by FHA. The setup needs only to be rounded out by industries, such as steel, in stimulating desire for new houses, either all-steel or steel framed, for remodeling which would entail the use of steel, or for new appliances and conveniences in present houses.

The consumers' market for electric refrigerators and stoves, heating systems, built-in cabinets, water and electric system on farms, lighting fixtures and other modern home conveniences which are on the white list of built-in equipment (STEEL, Sept. 10, p. 16) is being plowed and cultivated by appliance and equipment makers, many of them large buyers of steel. This market was described in STEEL for Sept. 17, p. 25.

Typical of the co-operation which this class of consumers of steel is extending is the campaign of the American Radiator & Standard Sanitary. The door is open to all. Last week a senator escorted an important manufacturer of household appliances requiring steel into the office of a high official of FHA and demanded to know why a competitor of his constituent had been permitted to tie in so closely with FHA. The senator and constituent soon left FHA, their arms bulging with bulletins and instructions which the constituent's secretary had been filing but his competitor was reading and acting upon.

Despite all the billions that have been poured out for relief and various work-making and industry-stimulating projects, Washington is coming to see that what is needed to put the country on a genuinely prosperous basis is a new industry. In 1921, it will be recalled, the automobile industry did the trick, so Washington is looking for the 1934 or 1935 version.

Opinion is concentrating on housing as this Moses. The shortage of houses is estimated from 5,000,000 upward. Heretofore, most housing efforts have been directed at the class from $10,000 up. The big potential market is believed to be in housing from $5000 down.

On all sides, it is conceded that the construction of houses by the fabrication of almost every piece of material on the job is antiquated. This new housing industry, which Washington visualizes, is based upon an even division of labor by factory and site. A pre-fabricated house which could be transported to the site in large sections and erected in a few weeks—perhaps even a few days—is the ideal.

In a copyright article in the September *Atlantic Monthly*, Alfred P. Sloan Jr., president of General Motors, crystallized these sentiments. It may be a warning for steel that the motor industry, prophet of mass production and a hard buyer, is interesting itself in housing.

INDUSTRY SHOULD GET BUSY

There are a good many in Washington who believe that if the steel industry does not take the lead in developing a pre-fabricated house, of which steel is the base, the automobile industry will do this.

A million pre-fabricated houses a year, requiring 5,000,000 tons of steel, would practically duplicate the automobile industry's consumption of steel this year.

Concentration of two such outstanding markets might make steel something of a "captive" industry, if not induce the automobile industry to become self-contained in the matter of steel, as Ford is now attempting.

EVEN without benefit of any creative thought or any sponsorship by the steel industry, the steel house is beginning to capture the imagination of some government officials in Washington.

Incidentally, these officials are rather mystified by the disposition of the steel industry to create a great deal of new finishing capacity (they have read about the many new continuous mills under way or contemplated) without any compensating initiative for new markets. The Washington viewpoint is that what steel needs is not so much reductions in salaries and curtailment of labor's working hours as the development of new markets.

By revolutionizing the housing of its labor in coal, coke, ore and mill communities, steel could virtually lift itself by its bootstraps. Normally, the steel industry supports about 420,000 wage earners, without including those in the supply industries such as coal, coke, ore, transportation, limestone, etc.

FUNDS ARE AVAILABLE

Were steel to come to Washington with a plan for an all-steel or a steel frame house costing less than $3000, with which to replace present housing in mill towns, at one stroke it would be solidifying its position with its own labor and using its own projects as a laboratory for a new outlet for steel.

If the steel and allied industries could mature a market for, say, 400,000 houses, each requiring two to four tons of steel in the framing, plus another ton for heating systems, built-in cabinets, etc., it would create at one stroke a market for 1,200,000 to 2,000,000 tons of steel.

Government funds for such a project could be had with little persuasion, it is believed. Considering the hundreds of millions that have been appropriated for undertakings frankly conceded to be experimental, to pinch off a few hundred thousand dollars to start steel housing projects apparently would come easily.

One authority who has been enthusiastic for the development of a housing market for steel visualizes a market of well over 5,000,000 houses entailing the use of more than 10,000,000 tons of steel.

Washington's imagination is beggared when it thinks of the millions of persons eager to acquire their own houses if the cost were not over $3000 spread over a 15-year period, to say nothing of some 800,000 couples setting up housekeeping each year.

Steel is now practically the only large industry which has not come forward actively to co-operate with the government in its housing and construction work. Lumber interests are represented for their wholesale, retail, and mill products divisions by specialists in the new housing administration, and publicity for lumber that could not be purchased at any price is being broadcast by the government. The same is true of paint and other industries standing to benefit from FHA.

There still is no official represen-

(*Please turn to Page* 30)

DETROIT

THERE are indications that the automobile industry, in introducing its 1935 models, will depart from the traditional method of a mass presentation at the January shows, and avoid building up retail sales to an early spring peak.

The new tactics will be to stagger the introduction of the new cars, let the public become accustomed to one newcomer at a time, and level off production, starting with new tools and dies.

General Motors apparently will follow this strategy: Pontiac will be the first out, followed by Olds and Chevrolet, with a breathing space between. It may be April before Buick, Cadillac and LaSalle have worked around to emerging with their new series for 1935.

One result is to ease the year-end pressure on the tool and die industry. No single die or tool supplier will have a complete program on which to work, one shop having one fender die, another a back panel, and so on.

FEDERAL APPROVAL SEEN

If this program is carried through, it will have the approbation of Washington, especially those interested in labor. Much of the labor difficulty of the automobile industry has been attributed to the high peaks and low valleys of production, and Secretary of Labor Perkins has frequently proposed staggering of new models, if not a decided reduction in the number of changes.

However, it does not seem probable that the new Ford, on which so much preliminary work has been done at Dearborn, will be held back for this stagger program. Plans have emanated from Dearborn on many parts, platoons of draftsmen have been recalled, die work on several new panels is under way, and many changes in design have been settled.

Certainly an aggressive Ford program is shaping up, judging from the company's high and successful bid for broadcasting the world series, involving $250,000, and the expansion of the Ford radio program.

Always with the reservation that Ford plans are subject to overnight changes, it appears that the Ford frame will be lengthened to somewhere between 117 and 121 inches, pushing the motor further forward over the front axle to eliminate an inflexibility in small cars over some surfaces even at moderate speeds.

Thus, this type of engine mounting precludes Ford going to independently-sprung wheels. It is a matter of record, speaking of placing the engine forward, that Packard's 1935 lines show the motor to be 8 inches further forward than in the 1934 models.

At all events, new Ford dies are being made for the curved-top coupe model and should be ready within another 45 days. Other changes at Dearborn recently have included some equipment buying covering a new method of making the Ford pushrods, also a revised manufacturing practice on pistons. The latter are now being turned.

Some idea of the coming Ford can be obtained from the redesigned torque tube, which will be 9 inches longer and increased in weight from 16 to 25 pounds. The diameter will also be larger. As with other changed parts, though, no production releases have as yet been granted for the new Ford parts. And, until that occurs, there is no certainty that the fates will have Mr. Ford's O.K. placed on the word to go.

Meanwhile, the operation of all of the Ford open-hearth steel furnaces still causes speculation in Detroit. Admittedly, Ford is not able to use all of the steel he has been making, therefore it is going into stock. Today there is more than 125,000 tons of steel on the ground at Fords, mostly in the semifinished form of billets.

Cognizant of the moot point that semifinished steel sometimes "seasons", it is possible that Ford is thus motivated, or that a sizable bank of semifinished is being built up for use when the new Ford strip mill begins to operate in about eight months.

PAY LESS FOR WRECKS

However, forecasting some decline in this steelmaking rate is a dimunition by Ford in seeking out old automobiles for melting purposes. For several years it has been practice there to pay $20 per car for old wrecks, flatten them out in a press, slice them up and dump them in a huge 400-ton mixer. Recently, though, Ford has dropped the price in some directions and is now paying only $6 per car, evidently one way of withdrawing from the market.

While developments proceed on the coming Ford, a snap continues to demand for the present car. Last week it became known that Ford would

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1932	1933	1934
January	119,344	130,087	156,907
February	117,418	106,888	231,707
March	118,959	118,002	331,263
April	148,326	180,713	354,745
May	184,295	218,347	331,641
June	183,106	253,387	308,051
July	109,143	229,357	266,575
August	90,325	232,855	235,000*

*Estimated.

Estimated by *Cram's Reports*

Week Ended	
Sept. 1	32,506
Sept. 8	38,166
Sept. 15	43,560
Sept. 22	38,329

build 15,000 more models over late this month and into early October than had been decided on a few weeks ago. Originally the September schedule was to be 35,000 jobs. Now, part of the additional 15,000 will swell that figure.

Unlike Ford, who is assembling five days weekly, Chevrolet is on a four-day basis and is working off a month that will account for 48,000 models. A growing share in the Chevrolet total has been in standards, but up through the first 15 days of September the ratio was still holding at around two master cars to each standard. Some of the Chevrolet assembly plants, such as at Buffalo, have been on standard assemblies almost exclusively for several weeks.

By last week Fisher Body had widely spread purchases of sheets on 1935 bodies. The sheet orders were small, however, and do not cover anything such as the volume tonnage Fisher will buy for Chevrolet. In fact, the 1935 Chevrolet sheet and strip sizes will not be ready until Oct. 1.

CHRYSLER TO EXPAND?

At Chrysler, events are moving more swiftly. By late in last week assemblies of the 1934 airflow models had been completed and some releases to Electric Auto-Lite, Motor Products and others had gone forth for 1935 parts. The Dodge foundry is down, probably until Oct. 1 when it resumes on new motor blocks. A bank of blocks will care for assemblies meanwhile. Electric Auto-Lite, incidentally, has lost no time on its recently-closed ignition and starting contract for Chrysler. It already has releases for 25,000 jobs in October on the new contracts.

Expansion of Chrysler is again the subject of rumors. Cincinnati is quickened by the report that a 100-acre site for a Plymouth assembly plant is under consideration just west of Cincinnati. Toledo hears again of some tieup of part of the Willys plant with Chrysler.

Willys, incidentally, is working on a program to build between 15,000 and 50,000 new models, subject to approval of federal court, these new models to be slightly changed from the present 77 line.

Windows of Washington

(*Concluded from Page 28*)

tation of steel, and efforts of individual producers to interest the official bodies of the industry in government projects have proved abortive.

Individual efforts have been inadequate, as evidenced by the attempt of one steel manufacturer and one steel fabricator a year ago to switch the construction of civilian conservation corps barracks from wood to steel. Despite the backing of the war department, which visualized portable steel barracks salvaged for wartime purposes from the CCC, the project went to lumber, and that industry received the biggest single order in its history.

PUSH "MORE STEEL IN HOME"

On Sept. 13, what may be considered the first step of FHA to interest individual manufacturers was taken when its industries division, under the direction of B. J. Flynn, met with representatives of such companies as Republic Steel Corp., American Rolling Mill Co., Youngstown Sheet & Tube Co., Jones & Laughlin Steel Corp., Bethlehem Steel Corp., A. M. Byers Co., American Hardware Corp., Yale & Towne Mfg. Co., Detroit Steel Products Co., Goldsmith Metal Lath Co., United States Pipe & Foundry Co., Consolidated Expanded Metal Co., Blaw-Knox Co., Stran-Steel Corp., Truscon Steel Co., Milcor Steel Co., Cleveland Steel Products Corp., and others.

Among other things, the opportunities for "more steel in the home," which was accepted as a broader description than merely to plug for the all-steel house, and closer tie-ins of steel producers and steel fabricators with FHA, were considered. One outcome was the resolve of Washington representative of steel interests to try to induce their home offices to co-operate.

PLAN HOUSING SHOWS

Surrounding this Sept. 13 conference was more of a businesslike air than has characterized any previous similar meeting of its kind under the new deal. In fact, the accepted business practice of holding the group together for luncheon, at the expense of the government, was adopted. Announcement was made that J. P. Young, acting for FHA, is arranging for 25 large housing shows in various parts of the country, at which the steel industry will have an opportunity to exhibit, if it chooses.

A STRIKING example, also, of the need for a spokesman in Washington for the entire steel industry has cropped out in the requirement for 55,000,000 fence posts for fencing the tree shelter belt which is to be planted in the western plains states, from Canada to Mexico, to overcome soil errosion and aridity.

At any time 55,000,000 fence posts constitute a good order. Averaging 7 pounds each, this number of steel posts would weigh 192,500 tons. Representatives of the lumber industry already are active, urging the selection of wood posts. The only effort that will be made to swing this business to steel will originate with the few representatives of fence manufacturers in Washington.

There is a weak spot in the argument because in some areas timber can be felled without impairing this national resource, nevertheless there is an anomaly in cutting down trees to provide posts on which to string fencing to protect growing trees. Steel also has an argument in durability, and the fact that lumber has fared much more generously than steel in government projects.

The fencing required for this belt of trees, which is to be 100 miles wide from border to border, with alternate miles left open, is estimated at 165,000 tons. Purchasing will be done by the Lincoln, Nebr., office of the forest service of the department of agriculture, the first 25,000 tons probably being inquired for next month.

This project, for which $15,000,000 already has been appropriated, will supply the excuse for another initialed government agency, probably PSBA—plains shelter belt administration.

There are some, like Governor Murray of Oklahoma, who contend that trees can no more be grown in the plains states than hair on a bald head, but until this is determined, fencing and posts will be required to protect this noble experiment.

E. G. Budd Backs Move For All-Steel Ships

Edward G. Budd, president, Edward G. Budd Mfg. Co., Philadelphia, pioneer in the construction of all-steel automobile bodies and trains, last week commended proposals to make ships fireproof, these proposals following the burning of the MORRO CASTLE Sept. 15.

Public preference for ships "tricked out with paneled walls and decorative hangings" can be changed to insistence upon fireproof ships, Mr. Budd declared. In 1907 he built a sample all-steel cabin. Since then his company has developed the all-steel automobile body and the stainless steel railroad trains. Steel can be substituted for paneling and partitions at an actual saving to ship owners, he maintains.

Franklin D. Mooney, president of the Ward line, operator of the MORRO CASTLE, has announced that his company is studying the use of steel instead of wood in superstructures of passenger vessels.

Brazil Gets Old Puddle Mill

A puddle mill formerly used by the old Fort Wayne Rolling Mills has been sold to a firm in Rio de Janeiro, Brazil, by the Joslyn Mfg. Co., successor to the rolling mill company. The South American firm will use the puddle mill in a new mill to be opened, said to be the first of its kind in Brazil.

"Union Seeks To Create Spirit of Hostility and Strife"—Girdler

PROFESSIONAL labor leaders, greedy for power and for the payment of dues into the treasury of their organization, seem to think the NRA was passed for their particular private benefit, and they seek to give the impression that the strong arm of the government will actually force control into their hands even in respect to an industry in which the majority of the workers do not want them and are entirely satisfied with their own form of collective bargaining," declared Tom M. Girdler, chairman of the board and president, Republic Steel Corp., who made the feature address before all engineering divisions of the Association of Iron and Steel Electrical Engineers Tuesday afternoon at Hotel Statler, Cleveland. Attendance was estimated at approximately 1000.

Mr. Girdler was introduced by I. Lamont Hughes, president, Carnegie Steel Co., Pittsburgh. Taking as his subject "Social and Industrial Relations Between the Employer and Employe," he cited advantages of employe representation plans as they now function in the steel industry, and then launched an attack upon labor union methods. Continuing he said:

Unions Give No Accounting

"If successful, would the union add to the income of the workers? On the contrary, the union would take from them vast sums in the form of dues for which they never make any public accounting. Apparently the officers of the unions can spend these vast sums of money without being responsible to anyone.

"Is it conceivable that the business agents of labor unions, who care nothing about plant conditions, can be as well qualified to discuss grievances as representatives chosen by the men themselves from their own number? I think not.

"The business agent of the union does not come to promote peace. He and his union thrive through promoting discord. The more dissatisfaction he can create, the greater the chance of securing new recruits for the union and the more dues for its treasury. The union continually seeks, and always has sought, to create a spirit of hostility and strife between employes and employers, where otherwise peace and harmony would prevail.

"There ought to be statutes in the United States similar to the provision of the British Trade Disputes and Trade Unions Act which, in England, makes it illegal and criminal to intimidate workers by force and violence such as is practiced by strikers.

"When congress provided for collective bargaining, I do not believe it intended to say that a bare majority of workers could prevent the minority from selecting their own representatives to deal with the management. Such an interpretation of collective bargaining would deprive the worker of freedom of action, instead of giving him greater liberty, and would subject him to the will of agents whom he did not choose and in whom he has no confidence.

"I am advised by my counsel and believe that such ruling is an incorrect interpretation of the law. It is simply a further attempt to impose the closed shop on industry."

"What is the situation in industry today? After a brief period of prosperity, there has come a collapse almost as serious as that existing in April, 1933. Unless we can have a general recovery of business this fall, the coming winter will present relief problems which will dwarf all that has gone before. In my opinion one of the fundamental causes for the halting of business is the uncertainty prevailing with reference to the unsettled and turbulent labor situation throughout the country."

Nonferrous Jobbers Discuss Code Costs

PROBLEMS of code administration centered interest at a general industry meeting of producers of nonferrous jobbing castings held at Hotel Bismark, Chicago, Sept. 19 and 20.

At the opening session Fred S. Jarrow, accountant, introduced the cost estimating and accounting system proposed for NRA aproval by setting forth the basic principles of the need for sound costs. Even in cases where business is contracted at a loss, knowledge is effective in decreasing danger. The cost system adopted with minor modifications will be referred to Washington for final approval. It embraces all factors covering material, labor and general expense.

A novel method of normalizing overhead contemplates establishing normal as 60 per cent of the best consecutive six months' production, in pounds, since Jan. 1, 1924. General costs of doing business, such as interest on investment, interest on debts, research and development, declines in market value of inventory and other items not permissible under NRA rulings are grouped with the profit item and are not mandatory. However, a foundry accused of selling below cost is amenable to penalty unless it can prove by a system of approximating the standard that its price was above cost.

The nonferrous code does not include standard trade customs and uniform terms of payment. These were discussed in detail and will be set up as a model recommended for observance. Both buyer and seller will secure protection against the unscrupulous by observance.

The nonferrous basic code provides that castings shall not be sold at a flat price per pound where weight and intricacy vary widely.

Accordingly, a committee selected a proposed classification covering simple, medium, semi-intricate and intricate castings ranging in weight from ⅛-pound to 150 pounds and in quantity from one to 125. This classification, intended as a yardstick to avoid quoting minute variations in evasion of the flat price prohibition, was referred to the committee for further consideration.

Personnel Is Selected

The miscellaneous sandcasting division was organized and reported a director elected from each of the ten districts. These, with a president and vice president elected from the industry at large, will compose the administrative agency for this division. The president of this division becomes a member of the basic code authority of the industry which in addition is composed of a representative from each of the other divisions and ten district directors.

The district directors recently chosen for the entire industry are as follows: J. A. Duncan, William Duncan Co., Boston; Charles E. Schley, Philadelphia Brass & Bronze Corp., Philadelphia; Thos. S. Hemenway, Metal & Alloy Specialties Co., Buffalo; J. P. Jefferies, Shenango-Penn Mold Co., Dover, O.; Edward Goldman, United Brass & Aluminum Co., Port Huron, Mich.; F. L. Hayes, Chicago Hardware Foundry Co., Chicago; George B. Miller, the Loeffelholz Co., Milwaukee; Charles Wegelin, Dixie Bronze Co., Birmingham, Ala.; William L. Heckmann, National Art Bronze Works Co., St. Louis; and Maurice S. Greenberg, M. Greenberg's Sons, San Francisco.

Officers of the association elected for the ensuing year by the industry at large at the dinner meeting are: President, N. K. B. Patch, Lumen Bearing Co., Buffalo; vice president, Allen B. Norton, Aluminum Co. of America, Cleveland; executive secretary, Sam Tour, Lucius Pitkin Co., New York.

Died:

P M. BOYD, 76, for many years secretary and treasurer of Lorain Steel Co., Johnstown, Pa., until he retired Sept. 30, 1929, in Sewickley, Pa., Sept. 14. Following employment in the iron and steel industry in Scotland, he came to the United States in 1888 and entered the Carnegie, Phipps & Co., Pittsburgh. In December, 1888, he became associated with the Johnson Steel Street Rail Co., remaining with this company when it was changed to the Lorain Steel Co., and being identified with both the Johnstown and the Lorain, O., works.

□ □ □

Emil Steinhorst Sr., 74, head of Emil Steinhorst & Sons, sheet metal manufacturer, Utica, N. Y., Sept. 1.

□ □ □

John L. Owens, 45, Minneapolis, identified with the farm implement manufacturing and selling industry, Sept. 16.

□ □ □

Theodore G. Peck, 86, of the steel plate firm of Phelps & Peck, New York, and Peck & Phelps, London and Liverpool, in West Haverstraw, N. Y., Sept. 16.

□ □ □

Willard S. Martin, 66, treasurer, general manager and director, Mead-Morrison Mfg. Co., East Boston, Mass., in Plainfield, Vt., Sept. 15, as a result of an automobile accident.

□ □ □

Edward V. Anderson, 58, vice president of the Golden-Anderson Valve Co., Pittsburgh, and vice president of the Monessen Sand & Gravel Co., Monessen, Pa., after an automobile accident near Pittsburgh, Sept. 15.

□ □ □

William C. Bolgiano, chief engineer of design for the Industrial Brownhoist Corp., Bay City, Mich., Sept. 19. For 25 years he was connected with the Brownhoist corporation and its predecessors in Cleveland, designing many iron ore and coal handling units.

□ □ □

Thomas O'Neil, 61, eastern representative of the Milcor Steel Co., Milwaukee, Sept. 15, at his home in Flushing, N. Y. He lived in Milwaukee nearly 40 years, and prior to going east 12 years ago had been superintendent of the Filer & Stowell Co. and associated for several years with the A. O. Smith Corp.

□ □ □

Charles B. McNaught, 57, chairman of the board of the Dominion Steel & Coal Corp., Sydney, N. S., at Aurora, his country home about 30 miles from Toronto, Ont., Sept. 16. He was identified prominently with many Canadian industries and was president of the Dominion company until 1932, when ill health forced his resignation.

□ □ □

Homer P. Edison, 57, Pittsburgh district manager of the Vanadium Alloys Steel Co., and the Colonial Steel Co., Pittsburgh, in Pittsburgh, Sept. 18. He was born in Port Huron, Mich., and went to Pittsburgh in 1914, having been identified with the steel industry for 20 years.

□ □ □

Edwin C. Reeder, 53, superintendent and general manager of the Hillside Fluor Spar Co.'s property in southern Illinois and Kentucky, residing at Rosiclare, Ill., in Waupun, Wis., Aug. 23, following an automobile accident, in which Mrs. Reeder was killed. A graduate of the Michigan College of Mines in 1901, he had been affiliated with the fluorspar industry of Illinois and Kentucky for 18 years.

□ □ □

James P. Roe, 74, inventor of the Roe iron puddling process, at his home near Douglassville, a suburb of Reading, Pa., Sept. 14. Born in Wales, he came to this country as a young man and invented the puddler which bears his name, about 20 years ago, while with the Pottstown Iron Co., Pottstown, Pa. He became associated in 1922 with the Reading Iron Co., Reading, Pa., and was encouraged to improve his invention, a large structure housing the Roe puddling mill being built there.

For some time Mr. Roe was general superintendent of the plant, and in recent years had been research director of the bureau of engineering of the Reading company.

Here and There In Industry

STEEL & TUBES INC., 224 East 131st street, Cleveland, is naming distributors of electrically welded mechanical tubing in important centers. Tubular Service Corp. has warehouse stocks at New York, Philadelphia and Boston; Service Steel Co. at Detroit, Williams & Co. at Pittsburgh, Hamilton Steel Co. at Cleveland and Edgar T Ward's Sons Co. at Chicago.

□ □ □

American Lumber & Treating Co., Chicago, in which the Chicago Bridge & Iron Works, Chicago, and the Aluminum Co. of America, Pittsburgh, have acquired an interest, features treatment of lumber by the wolmanizing process which, in addition to making lumber fire-resistant and immune to termites, also preserves metal fastenings against corrosion.

□ □ □

Kearney & Trecker Co., West Allis, Wis., manufacturer of milling machines and other machine tools, is experiencing a decided gain in business over last year. Employment has increased from 100 men to 425, working in two shifts. Orders are in hand from United States navy and various plants in the United States, and Japan, France, England, Italy and Sweden.

□ □ □

Clyde Sales Co., Duluth, has been awarded a swinging engine on a low bid of $1499 by the Pittsburgh army engineers. The engine will be placed on the United States dredge BEAVER.

□ □ □

Joseph J. Kovar Co., Owatonna, Minn., manufacturer of agricultural implements, has been sold, subject to confirmation by district court, to five bondholders, children of Joseph J. Kovar, deceased, its founder. The sale includes the plant, all accounts, equipment, patents, goodwill and trade name. Reorganization will follow confirmation of the sale.

Industry To Draft Legislative Plan

STEEL and metalworking industries are generously represented on a committee created last week by the National Association of Manufacturers, New York, to formulate a program reflecting the view of industry upon the proper relationship of government to business for presentation before January to congress and the administration.

Such matters as federal control of wages and hours, regulation of competitive practices, control of production, price control, agricultural adjustment administration, machinery of industrial self-government, and cooperation with other organizations, will be considered.

On the committee, of which James W. Hook, president, Geometric Tool Co., New Haven, Conn., is chairman, steel and metalworking representatives include William L. Allen, consulting engineer, American Rolling Mill Co., New York; George H. Houston, president, Baldwin Locomotive Works, Philadelphia; T. M. Girdler, chairman, Republic Steel Corp., Cleveland; C. C. Carlton, secretary, Motor Wheel Corp., Lansing, Mich.; Paul C. De Wolf, vice president, Brown & Sharpe Mfg. Co., Providence, R. I.; John Frederick, chairman, Continental Steel Corp., Kokomo, Ind.; C. Edwin Michael, president, Virginia Bridge & Iron Co., Roanoke, Va.; Harold C. Smith, president, Illinois Tool Works, Chicago; H. M. Taliaferro, president, American Seating Co., Grand Rapids, Mich.; F. H. Willard, president, Graton & Knight Co., Worcester, Mass.; C. B. Ames, president, Texas Co., New York; and C. E. Adams, president, Air Reduction Co., New York.

Industrial Men in the Day's News

MELVIN PATTISON, formerly executive vice president and secretary of Industrial Brownhoist Corp., Bay City, Mich., has been elected president and treasurer of the company, succeeding Alexander C. Brown, who as noted (right) has resigned as president of Industrial Brownhoist to become first vice president of the Cleveland-Cliffs Iron Co., Cleveland.

Edward S. Clark, a director since 1927, has been elected secretary of Industrial Brownhoist.

Hoyt E. Hayes, formerly export sales manager and manager of Cleveland district sales, has been elected vice president and sales manager and shortly will move to the general offices at Bay City.

George A. Long, plant manager and assistant secretary, has been elected vice president in charge of manufacturing,and retains the office of assistant secretary.

James B. Hayden has been appointed assistant sales manager.

Ernest Taylor, continues as vice president in charge of engineering and purchasing, and Arnold J. Copeland as assistant treasurer.

□ □ □

Walter J. Bothwell has been appointed district sales manager of the Detroit district for Jones & Laughlin Steel Corp., Pittsburgh, succeeding the late Frank D. Heath.

Mr. Bothwell, formerly vice president of the Higgins-Bothwell Co., Detroit, entered the steel business in 1903 with the Union Drawn Steel Co. He remained with that company until 1924 when he and Dean Higgins formed the Higgins-Bothwell Co. From 1927 until recently this company represented the Jones & Laughlin Steel Corp. in the Detroit territory for the sale of cold-finished steel.

□ □ □

A. J. Brandt, consulting and management engineer, has been appointed assistant general manager in charge of engineering, purchasing and production for the Hupp Motor Car Corp., Detroit. He has been active with various units of the automotive industry since 1919, having supervised the erection of several large car building plants. He is a graduate of Case School of Applied Science, Cleveland.

□ □ □

Wesley P. Sykes, research metallurgist for the Cleveland wire division of the General Electric Co., Cleveland, has been appointed professorial lecturer in the department of metallurgy at Case School of Applied Science, Cleveland. Mr. Sykes will continue his work in industry, but will offer a group of courses in the day and evening divisions at Case and will supervise certain research projects of advanced students. He is a graduate of Case, having received the advanced degree of metallurgical engineer in 1920. He has received wide recognition for his original work on tungsten, molybdenum and their alloys.

□ □ □

Capt. H. B. Lebkicher, army ordnance department, Washington, has been appointed administration member on the manganese code authority.

□ □ □

C. A. Hammerly has been appointed general sales manager by the Louden Machinery Co., Fairfield, Iowa, farm division, which comprises barn and poultry equipment, hay unloading tools, door hangers and the like. He joined the company 10 years ago.

□ □ □

Harry J. Morland, vice president in charge of tubular sales for the Oil Well Supply Co., Dallas, Tex., has left for an extended business trip through eastern industrial centers.

□ □ □

H. S. McPherson has been appointed manager of mechanical goods sales in the St. Louis district for the mechanical goods division of United States Rubber Products Inc., New York.

□ □ □

W. E. Sanders, formerly plant and metallurgical engineer in the forgings division of the Buick Motor Co., Flint, Mich., is now associated with the Delco Products Division, General Motors Corp., Dayton, O.

□ □ □

D. W. Burgoon, vice president and general manager of Yeoman Bros. Co., Chicago, centrifugal pump manufacturer, has been elected to the board of directors.

H. Y. Jeffery, sales manager, was elected to the additional office of secretary.

Alexander C. Brown, New First Vice President, Cleveland-Cliffs Iron Co.

Standiford photo

He has resigned his position as president of a hoisting machinery company, held since 1918.

Graduate of Yale, he comes from a family prominently identified with the iron ore industry.

Civic, educational and political activities at times have claimed a share of his attention.

ALEXANDER C. BROWN, formerly president of the Industrial Brownhoist Corp., Bay City, Mich., has been elected first vice president of the Cleveland-Cliffs Iron Co., Cleveland. He has resigned from the Bay City organization and will assume his new duties at once.

He graduated from Yale university and continued studies at Case School of Applied Science in Cleveland, later entering employ of the Brown Hoisting Machinery Co. of Cleveland, a company founded by his grandfather, the late Fayette Brown. Working up through several positions, Mr. Brown became president in 1918.

Subsequently the company was merged with the Industrial Works of Bay City, and he continued as president. His family for years has been prominent in the iron ore industry.

At one time he was active with the Cleveland chamber of commerce, being president in 1921. In 1930 he was named president of the board of trustees of University school, Cleveland.

EDITORIAL

Industry Still Is Amateurish In Dealing With Public

INDUSTRY labors under a tremendous handicap because its leaders do not fully understand the value of public good will and are sadly deficient in the art of winning the respectful attention of the man in the street.

This fact never was demonstrated more forcibly than during the past 18 months. Time and time again industry has lost its case in the court of public opinion simply because its spokesmen have been inept, while their opponents have displayed great skill in the science of public relations. In most of these skirmishes, industry has been arrayed against professional union labor or against advocates of the more radical features of the new deal. With few exceptions, industry has gone down to ignominious defeat.

One of the difficulties in the situation lies in the fact that the American public is in a tense, nervous state. Under these conditions, a play to the emotions is more effective than an appeal to reason. President Roosevelt and all of his cohorts seem to realize this fact and are making capital of it. William Green and his associates recognize it, and are profiting thereby. Industry, on the other hand, still is relying upon the weapons of drab fact and cold logic.

Industry Cannot Use Vituperative Methods Employed by Politicians and Labor Leaders

While the old adage "fight fire with fire" suggests a tempting solution of the problem, we do not believe industry can help its case by imitating the ballyhoo methods of its opponents. Admittedly President Roosevelt has gained a temporary advantage by ridiculing industry. Through the radio, which gives him a larger audience than ordinarily is afforded any other speaker on subjects of national interest, he has been quite successful in convincing millions of people that anyone who criticizes the new deal is a tory, that tories are controlled by a small group in Wall Street, that industry is dominated by greedy owners who make huge profits by exploiting underpaid labor, that the steel industry profiteers on rail prices, and that in many other ways industry is not worthy of the trust of the American people.

Of course, in indulging in these gross slanders, the President abused the privilege of his high office, yet at the same time his unwarranted attack automatically frees industry from restraint in defending itself in the court of public opinion.

How shall industry proceed in winning back the understanding and esteem of the people?

It cannot well employ the weapons of derision, contempt, etc. which appeal to mob emotion. It will not lower itself to use trickery, deceit or unfair propaganda. Ignoring all of these cheap expedients, industry should continue to use facts, to appeal to reason rather than to emotions, and to pin its hope for victory upon a steady campaign of education.

However, this program will fall short of success unless it is executed with tact and skill. Thus far in the depression the leaders of industry frequently have lacked finesse in dealing with the public.

Facts, Presented Intelligently and with Finesse, More Effective than Ballyhoo

For instance, the initial publicity of the recent meeting of the durable goods industry at Hot Springs, Va., was unfortunate. Probably through no fault of anyone connected with the durable goods committee or with the industry, a leading metropolitan newspaper featured a story to the effect the industry wholeheartedly approves a complete scrapping of every phase of the new deal. This was such a flagrant distortion of the facts that the spokesmen for the durable goods industry were forced to issue emphatic denials. In the meantime, labor, through Mr. Green, made capital of the situation.

Undoubtedly there are executives who hope that every remnant of the new deal will be destroyed, but even those who hold this extreme view know, or should know, that there is not a chance of "selling" that idea to the public at this time. The better method, we believe, is to point out specific mistakes in national policy, to acknowledge meritorious proposals as they appear, to condemn anything that is malicious or destructive, and in general to comment fairly on all policies in terms of the public interest.

The big job is to convince the people who vote that reasonable profits for industry mean general prosperity for the nation and that federal strangulation of business means poverty for the masses. The way to accomplish this is not to issue bombastic, blanket criticisms but to provide specific information which the man in the street—who is more intelligent than you think—can understand.

THE INDUSTRIAL DIAL

Published in the last issue of each month as part of
The Business Trend Section of STEEL
Copyright 1934 by Penton Publishing Co.

AT THIS writing the third quarter seems to be destined to close without the appearance of a definite upturn from the drab conditions which have characterized most of the three-month period.

The slump which began in July, and which was alluded to as a "seasonal" letdown, has continued far beyond the bounds of a normal summer lull. At times, faint signs of improvement appeared, but no substantial betterment materialized. On the contrary, in many lines the trend has been more downward than upward.

In September industrial activity has been unusually spotty. The heavy producing industries, such as iron and steel, struck a low point early in the month and have recovered only slightly since that time. The equipment industries held up moderately well until only a few weeks ago.

General indicators, such as revenue freight car loadings and electric power output, have continued at encouraging levels. Retail trade, which is the most sensitive barometer of general purchasing power, has improved moderately since Labor day.

The indexes of business activity, which strike a fair average for these various conflicting factors, show that business volume now is about at the level of last November, when the trend was downward, or at the level in January, when the nation was climbing up from the year-end.

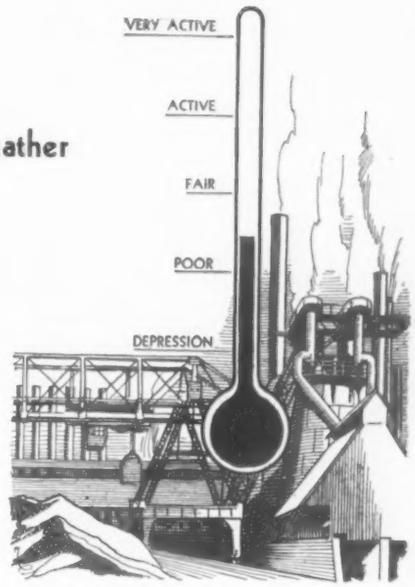
In some respects the present conditions are reminiscent of the pre-election hesitancy of September and October, 1932. Then the uncertainty was due to fears about the unknown future. Today it is due, not only to qualms as to what is ahead, but also to the sad experience of what actually has happened and is happening.

Most of the adverse sentiment of the present may be traced directly to the disillusionment afforded by President Roosevelt's Green Bay address and his subsequent acts. The most hopeful aspects of the situation are that every day

Industrial Weather

TREND:

Uncertain



The Barometer of Business

Industrial Indicators

	Aug., 1934	July, 1934	Aug., 1933
Pig iron output (daily average, tons)	34,199	39,630	59,137
Machine Tool Index	37.1	38.6	27.9
Finished Steel shipments (tons)	378,023	369,938	668,155
Ingot output (daily average, tons)	50,495	58,903	106,058
Dodge Bldg. awards in 37 states (sq. ft.)	.....	13,250,000	13,002,200
Automobile output	*235,000	277,689	242,559
Coal output, tons	27,490,000	25,280,000	33,910,000
Business failures, number	929	912	1,472
Business failures, liabilities	$18,459,903	$19,325,517	$42,776,000
Cement production, Bbls.	.....	.....	8,223,000
Cotton consumption, bales	.....	.....	588,570
Car loadings (weekly av.)	604,977	586,574	625,679

*Estimate.

Foreign Trade

	Aug., 1934	July, 1934	Aug., 1933
Exports	.....	$161,787,000	$131,000,000
Imports	.....	$127,342,000	$155,000,000
Gold exports	.....	$114,000	$81,473
Gold imports	.....	$53,330,000	$1,085

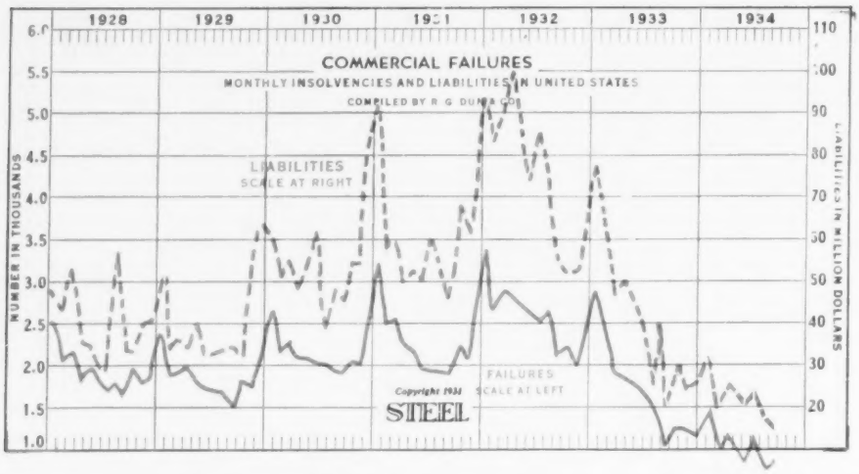
Financial Indicators

	Aug., 1934	July, 1934	Aug., 1933
25 Industrial stocks	$130.46	$131.06	$135.86
25 Rail stocks	$28.19	$31.06	$40.63
40 Bonds	$80.04	$81.55	$77.18
Bank clearings (000 omitted)	.....	$18,670,062	$16,408,656
Commercial paper rate New York (per cent)	1	1	1¾
*Commercial loans (000 omitted)	$4,555,000	$4,445,000	$8,533,000
Federal Reserve ratio, per cent	70.2	69.9	67.5
**Railroad earnings	$35,220,889	$41,836,302	$64,752,602
Stock sales, New York stock exchange	.....	21,115,884	42,466,352
Bond sales, par value	.....	$264,604,200	$216,100,700

*Leading member bank Federal Reserve System.
**July, June and July, respectively.

Commodity Prices

	August, 1934	July, 1934	August, 1933	Average 1913
STEEL's composite average of 14 iron and steel prices	$32.24	$32.32	$30.04	$26.32
Bradstreet's index	.....	$9.32	$8.99	$9.21
Wheat, cash (bushel)	$1.17	$1.07	$1.07	92c
Corn, cash (bushel)	90c	71c	66c	51c
Petroleum, crude (Bbl.)	94c	94c	87c	$2.50



Number

August, 1934	929
July, 1934	912
August, 1933	1472

Liabilities

August, 1934	$18,459,903
July, 1934	19,325,517
August, 1933	42,776,049

the mistakes of the administration appear in clearer relief and that the Chief Executive cannot much longer ignore the need for a drastic change in policy.

Another encouraging sign is the rapidly growing militant spirit in finance and industry. The sense of sportsmanship which caused many industrial leaders to support the new deal in its formative period has changed to a feeling of outrage at the manner in which the government administration has abused that trust. Business leaders now are devoting more attention to ways and means of stimulating recovery through the resources of business—independently of and in spite of the hand of federal bureaucracy.

Where Business Stands

Monthly Average, 1933—100

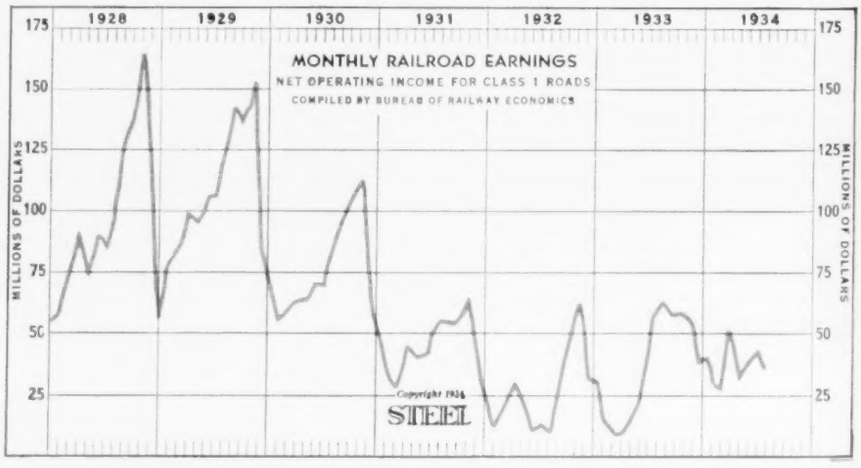
	Aug., 1934	July, 1934	Aug., 1933
Steel Ingot Output	65.7	79.8	143.7
Pig Iron Output	94.4	109.4	163.3
Freight Movement	108.6	105.3	112.4
Building Construction	.....	108.1	106.1
Automobile Output	139.3	164.5	143.7
Wholesale Prices	.....	118.6	114.4

August Commercial Failures Continue at Low Ebb

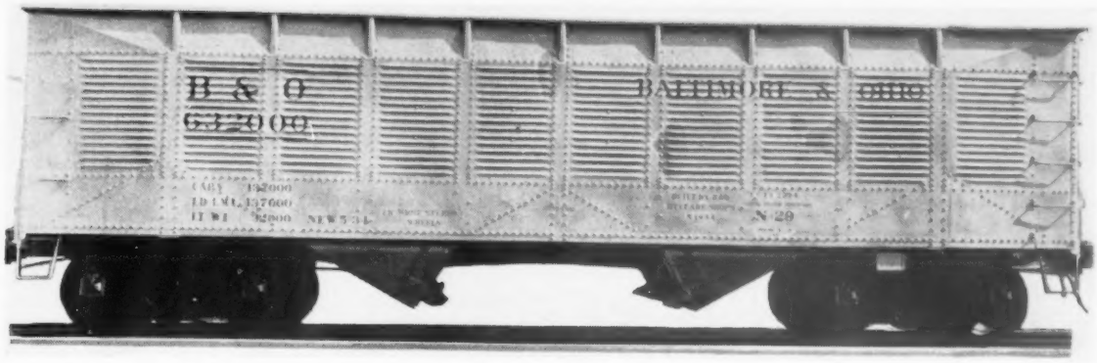
Business failures in the United States during August were slightly more numerous than those in the preceding month. With the exception of July, however, the number was below that for any preceding month, back to September, 1920. According to Dun & Bradstreet there were 929 business defaults during August, involving a total indebtedness amounting to $18,459,903. These figures compare with 912 failures in July, with total liabilities of $19,325,517 and 1,472 similar defaults in August, 1933, for which liabilities amounted to $42,776,049.

Railroads Earn 1.52 Per Cent On Investment in July

Net operating income of Class 1 railroads during July declined slightly to $35,220,889, which was at an annual rate of return of only 1.52 per cent on their property investment. During June net income totaled $41,836,302 and in July, 1933, income was $64,752,602 or a return of 2.77 per cent on investment. Income for the first seven months of this year was reported at $261,024,805 compared with $219,481,527 during the same period in 1933.



July, 1934	$35,220,889
June, 1934	41,836,302
July, 1933	64,752,602



Lightweight hopper car built principally of USS Cor-Ten, a new high tensile steel

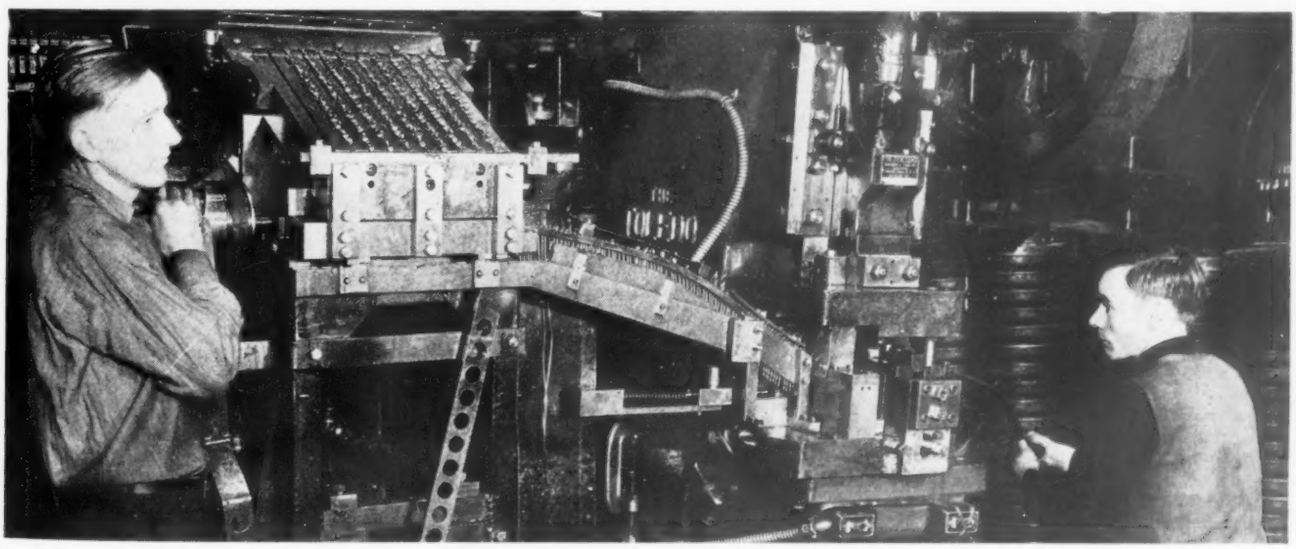
NEW ALIGNMENTS ARE CHALLENGE TO INDUSTRY'S TECHNICAL PERSONNEL

IN THIS issue, which is devoted so largely to the transactions of current and approaching meetings of technical societies, it is appropriate that attention be given to the problems of the engineers, metallurgists, superintendents and other members of the technical and operating personnel of industry.

Anyone who thinks that the heavy hand of five years of depression has fallen exclusively upon the executives of industry is badly mistaken. While it is true that most of the burden of codes, NRA compliance, and many other complexities of government supervision has fallen upon the shoulders of officers in the front offices, it should not be forgotten that the influence of hard times, new deal and reconstruction has introduced new problems to the men in the laboratories, drafting rooms, shops and mills.

These problems may be classified under three headings. The first includes those which are caused by the need of economy. In research, design, production, manufacture—in fact, all along the line—the drastic reduction in departmental budgets imposed a challenge to the resourcefulness of all department heads.

The second classification covers all problems traceable to the operation of NRA codes and to other phases of industry's co-operation with the government. Here the superintendents, foremen, and others charged with the smooth functioning of production and manufacturing units



This device for feeding spokes in a wire wheel assembly is typical of the trend in mechanization in operations for mass production

encountered conditions of a most exasperating character. The new hour and wage provisions played havoc with established routine; they provoked confusion and in many cases brought down strenuous protests from employes. The collective bargaining clause—never clearly interpreted—subjected all employes to the annoyance of over-enthusiastic national labor union organizers and sometimes to the thuggery of radical agitators and racketeers. All of these developments introduced new complications into the work of superintendents and foremen.

Realignments More Sweeping

Unlike these first two classes of problems, which are directly traceable to the conditions of depression and attempted recovery, the third class embraces questions of more indirect character, which have long term rather than short term significance. Chief among these is the realignment of materials, processes and parts brought about through economic, scientific, social and other changes occurring during the depression period.

In order to explain this point clearly it is necessary to compare certain conditions of today with those which prevailed in the more or less "normal" period prior to the crash of 1929. This comparison is particularly timely because it emphasizes a significant change in industry which is of direct interest to tens of thousands of the technical and operating men who are participating in the conventions and expositions of the current season.

Under the average conditions prevailing in the pre-depression period, a fairly stable relationship existed between the various groups of companies which shared in the work involved in certain contracts or projects. For instance, if a railroad company announced that it was in the market for 20 passenger cars, immediately the scores of companies which had been accustomed to supplying wheels, truck bolsters, brake beams, air brake details, couplers, sills, roof, window frames, doors, and hundreds of other parts assumed without question that they would be asked to bid for their share of work of the 20 cars.

In many cases, the force of habit or the experience of harmonious cooperation between companies on many orders in the past had established bonds so strong that it was considered a certainty that if Company A received the order for building the cars, then Company B would be given the order for axles, the journal boxes would go to Company C, etc., etc.

Similar relationships often existed in connection with the design of equipment, the materials selected for its construction and the processes employed in their fabrication. Again using the car building industry as an example, it was almost a foregone conclusion that if a contract for cars were awarded to a certain company, the cars would conform, at least in major details, to the established design and construction which had become more or less standard with that company.

It would be unfair to say that car builders, or in fact the makers of any other type of equipment, were excessively hidebound in the pre-depression era. However, it is a fact that design, choice of materials, selection of methods, etc., had settled into treadworn channels. Improvements were being introduced frequently, but seldom did an innovation seriously disrupt the established routine of the plant or necessitate great changes in equipment.

Today the fancied security of markets which existed prior to 1929 has disappeared. Great changes are in the making. Few materials, methods or types of equipment enjoy unchallenged supremacy in any field. The old rivalries have been intensified during the depression, and many new ones have sprung up.

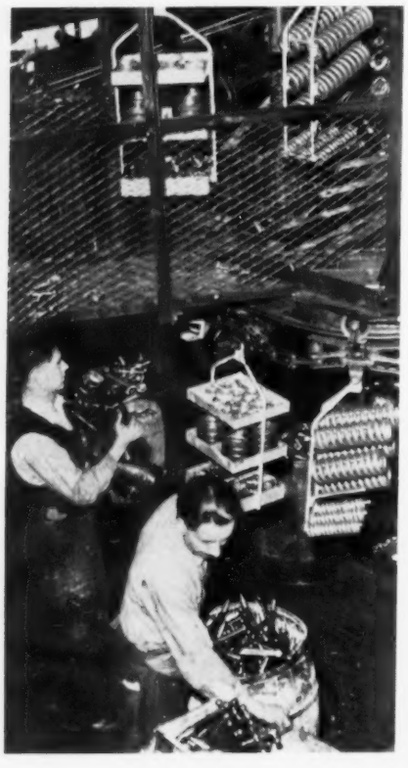
Discard Traditional Design

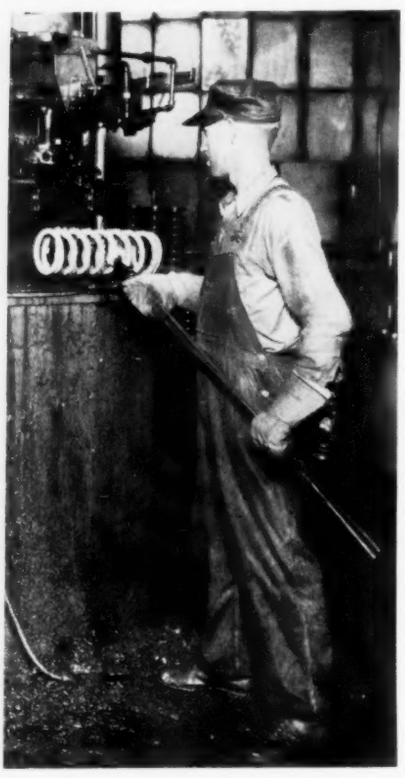
The great contrast in conditions can be illustrated by two well known developments of recent months. When automobile engineers decided to use coil springs on certain models, the adjustments made necessary by this change extended through a broad sector of the metalworking industry. Its influence was felt all the way from the assembly plant back to the rolling mills.

Again, when the stream line passenger trains and subway cars were designed, more traditions in the field of rail transportation were violated than at any previous time in the development of American railroads. Old materials were abandoned, the customary methods of fabrication were almost ignored, and in many other ways the designers departed from orthodox ideas.

These two illustrations are typical of scores of similar instances in which individuals with courage and imagination have jolted industry from some of its traditions. If one will analyze any of these startling new developments, he will find that the designers have done nothing more than reshuffle the materials and methods which are available to everyone.

Everything incorporated in the Burlington "Zephyr," for instance, had been employed previously in other fields. The shot welding of the car body members was borrowed from the experience of automobile body assembly. The use of welded alloy steel in the engine bed and truck frames was a logical outcome of the experience in the use of weld-





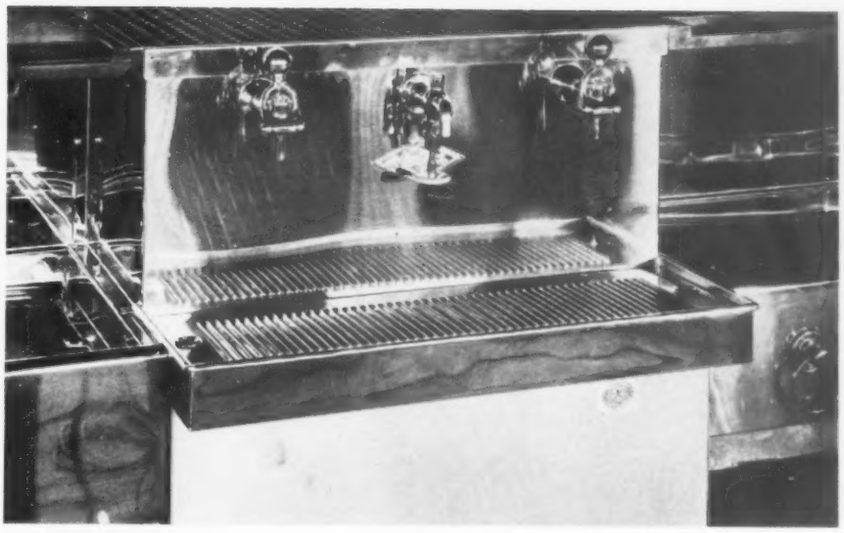
When automobile engineers adopted a new method of spring suspension on certain models, the change in design called for realignments which extended all the way from the assembly plants back to the rolling mills. Above is shown part of an elaborate conveying system which was adapted to the new requirements imposed by coil springs. At the right a heat treating operation is shown

ed rolled steel for machinery bases. Greater use of insulation to minimize vibration, to deaden noise and to guard against rapid temperature changes was a contribution from insulation development in numerous industries. From start to finish, the innovations which seemed to make the Zephyr an outstanding example of revolutionary design had been tested previously in other fields.

Advances in Metallurgy

The reshuffling will continue until long after industry has returned to the safe highroad of business recovery. Realignments will be encouraged by the growth of new materials, methods and types of equipment. The article beginning on page 41 of this issue discusses a few of the alloys of steel which in recent years have gained favor for certain applications. This embraces important developments in one small sector of the metallurgy of iron and steel. Similar progress is being made in the field of nonferrous metals. Nonmetallic compounds will figure more prominently in design of the future.

Reshuffling also will be helped by the advances in the processes by which metals are produced. The rivalry between rolled, cast and forged metal perhaps is keener today than at any time in the past. Foundry products particularly, are waging a new drive for favor. The manner in which alloy gray iron and semisteel castings are winning applications in the automotive industry is indicative of the new spirit which marks the current activity in the casting industry. Large cast car bodies, underframes, hoppers, etc.—recent products of the steel foundries—have intensified rivalry in the railroad freight car field. This was an important factor in the present activity in lightweight car construction, employing alloy high tensile steels.



Abandonment of legal restrictions on beer and liquor furnished a slight impetus to certain materials and processes. Stainless steel was well adapted to the requirements of bars and bar fixtures

Another development which facilitates the reshuffling of materials and methods is the increased efficiency of producing and manufacturing equipment. A good illustration of this is found in the machine tool field. The tungsten carbide tools, which were introduced about five years ago, and other improved cutting materials, have enabled machine tool builders to design sturdier machines, with higher speeds and greater machining capacity. One builder reports that a current machine of the same size as one built 10 years ago is capable of removing twice as many cubic inches of metal in the same period of time. This machine takes up the same amount of floor space as one of the old type, and yet it does double the amount of work and doubles the productivity of the man who operates it. In addition, improvements in design give a machine of this type a greater range of feeds and broader adaptation to various types of work.

Productivity Is Real Index

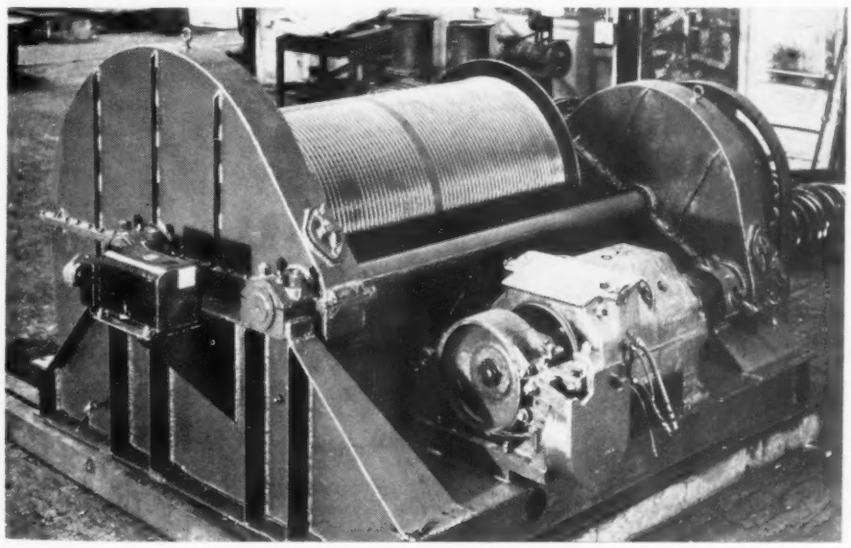
The most significant result of such advances made during depression years in metalworking machinery is that it is no longer possible to measure plant capacity in square feet. Instead it must be measured in productivity per machine.

Another incentive to realignments is the advance in handling of materials in connection with machining or assembling operations. Hopper feeds, automatic discharge devices, etc. now are commonplace.

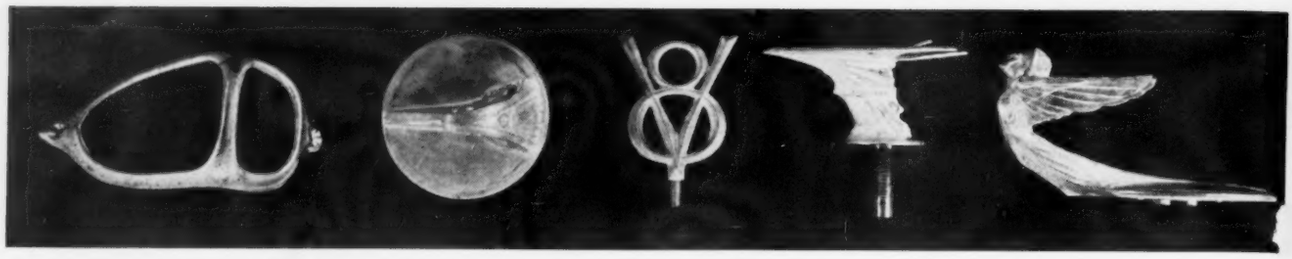
One could go on indefinitely citing instances in which the old alignments have been broken down and new ones established. Most of these changes are based upon improvements in the materials or in methods which have permitted designers to depart from traditional construction.

There is nothing new in this, except in the degree of change. Improvement and refinement always are factors in industrial development. They were active in the pre-depression period, even in branches of industry in which progress was slow and initiative impaired. The point which differentiates the present changes from those of other, more tranquil periods is the broad, sweeping character of the innovations.

The changes involved in the streamline passenger trains, the current revolution in the design of freight cars, the marked alterations in the appearance and construction of household appliances—such as stoves, refrigerators, etc.—all of these are devas-



Progress in welding has been an outstanding feature of the depression period. Construction such as pictured here would have been considered unusual only five years ago. Today it is typical of practice in many equipment shops



Applications of die castings have multiplied during the depression period

tating in their effect upon the old routine of manufacture. They throw out of alignment many of the customs of industry. Overnight they obsolete expensive equipment, disturb conditions of employment and otherwise tend to upset the smooth routine of industrial operations.

A Necessary Step To Recovery

However, alert industrial executives recognize these sweeping new alignments as sure signs of readjustment for recovery. In the very devastation wrought by these changes, one witnesses one form of deflation which is a necessary and inevitable step in the road to substantial business prosperity.

The transformation which is occurring now is but a repetition of what has transpired in other crises. Today, however, the scope of change is broader, the operations involved are more complex and the disturbances thus created are more painful—all due to the more intricate character of industry as it exists today. The problems now confronting metalworking establishments are not much more formidable to the individual company than were the problems imposed upon wagon and carriage builders when the automobile came into being.

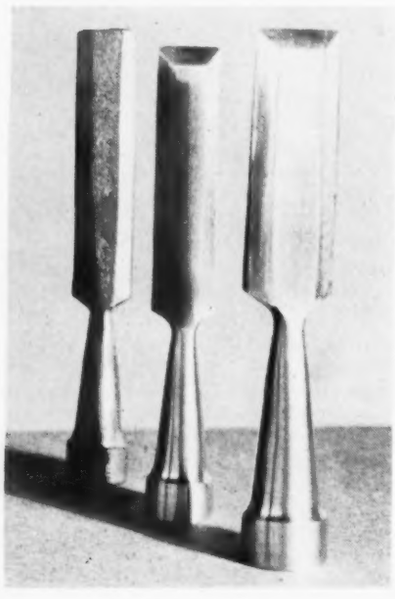
Now, as then, the only defense against the threat of these changes is progressiveness. This involves not only the right type of executive administration in each company but it also requires that the technical and operating executive personnel measure up fully to its responsibilities. Wherever you find a company in which the chief engineer or the responsible operating heads are too cynical of new processes, new materials, or new equipment, you will see a company that is in constant danger of losing its business to more alert competitors.

The responsibility of knowing the latest developments in metallurgy, design, methods, etc., falls upon the shoulders of the technical personnel of the metalworking industry. Ability to pick a winner from the losers among the hundreds of new developments which constantly are demanding attention is an important asset. That ability grows with experience, but it can be hastened and stimulated by keen observation of what technical and operating men in other companies and in other industries are doing.

A Cross Section of Industry

Next to the mediums of experience and the printed page, the national conventions and expositions of engineering and industrial associations afford the best cross section of corrent progress.

Events of this character, scheduled for this and coming weeks, will be more important than their predecessors of the past few years. They reflect the realignments discussed in this article more clearly than has any convention or industrial show in more than a decade. To keen observers, they afford significant hints of what may be expected in the future.



New Records in Russian Steel Production

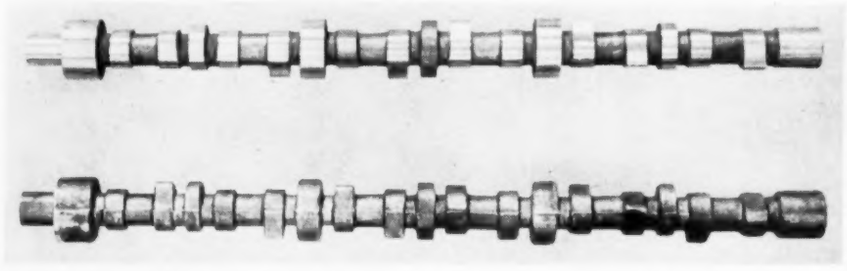
Interesting data now are available regarding the progress of the Russian steel industry. According to figures collected by an authoritative source, the National Federation of Iron and Steel Manufacturers, London, England, the Russian steel output for 1933 was 6,740,400 tons. A comparison of this with the record for recent years is given in the following table compiled from the same source:

Monthly Steel Output

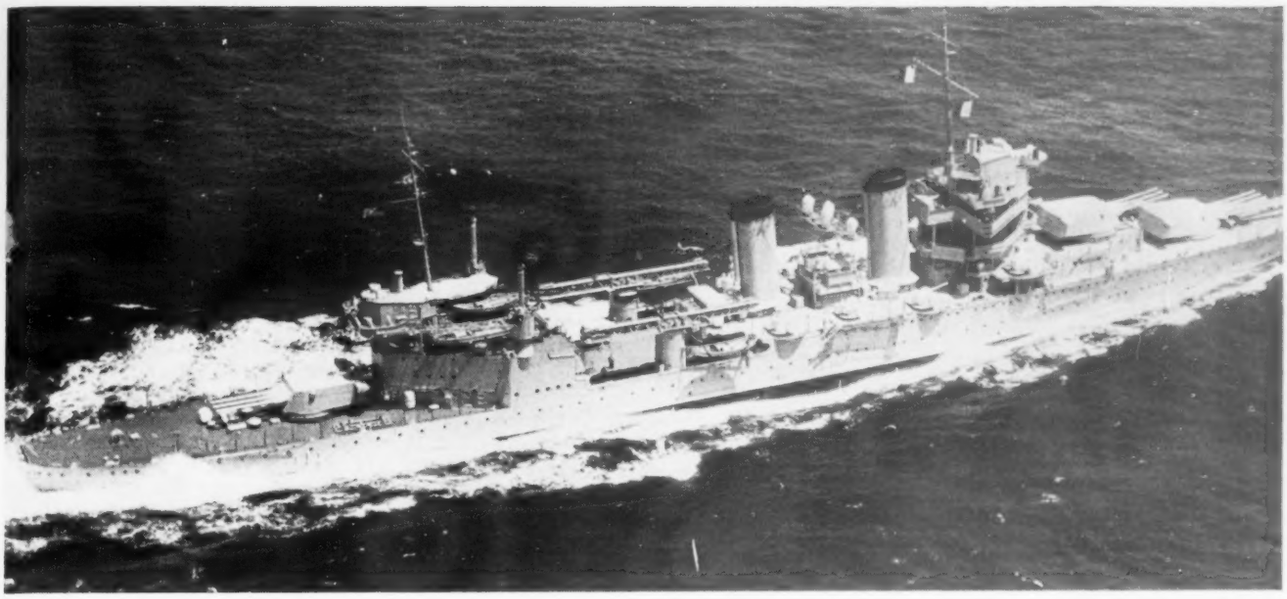
Year	Gross Tons
1913	363,000
1931	442,100
1932	491,700
1933	561,700

Thus at 561,700 tons per month or 6,740,400 tons for the year, 1933 was the largest in the history of that country. This would seem to indicate that the 5-year plan had been at least partially successful. It is also of interest to note that 1933 Russian steel output was close to that of Great Britain which was 7,003,200 tons or 583,600 tons monthly. This achievement places Russia in fourth position among the steelmaking countries.

Even more significant are the data for 1934. To June 1 the Russian steel production has been at the rate of 723,400 tons each month which is nearly 30 per cent larger than the 1933 rate. The largest output this year was 770,800 tons in April. If the present rate is maintained, the year's output will be 8,680,800 tons.



These cast camshafts illustrate how improved gray iron or semisteel castings have made inroads against forged steel for certain automotive parts. The cast woodworking chisels, shown at the left, are of Z-metal. Their Rockwell hardness is lower than that of forged steel, yet they are durable and have given good service



—Wide World Photo

The navy department has found low-alloy high-strength steels advantageous in reducing weight of speedy cruisers without sacrificing strength. Here is the recently built U. S. S. WASHINGTON, *10,000-ton light-armored heavy cruiser, 588 feet long, 61 feet 9 inches beam, capable of a speed of 32.5 knots. Main battery comprises nine 8-inch guns*

Low Alloy High-Tensile Steels . . .

Materials in This Classification, Covering Wide Range of Compositions, Offer Economies in Reducing Weight Without Sacrificing Strength

BY EDWIN F. CONE

ONE of the important developments, or trends, in alloy steel metallurgy, which recently has been decidedly emphasized, is a type known as a low-alloy high-tensile steel. A low-cost steel, this material, because of relatively and moderately high tensile strength, can be employed structurally where lightness can be obtained without sacrifice of strength. Such steels usually are used in the "as-rolled" condition —no heat treatment is employed.

More recent demands have involved the development of a steel which should have, besides high strength and elastic limit, excellent welding properties, a reasonable fatigue resistance so that it can be more highly stressed, and also some resistance to corrosion in the atmosphere. To attain all these properties in one steel is not a simple matter.

Develop New Uses, Analyses

The modern tendency in both railroad and ship construction is to lighten the structure without sacrifice of strength, necessitating steels having some or all of the properties here outlined.

This general type of alloy steel—low-alloy, high tensile—is not new. Only the tendency to exploit uses and to develop new compositions is new. Some of the more familiar steels of this nature have been known for a number of years. Probably the first one was the well-known 3 to 3.5 per cent nickel steel. Then came the medium-manganese steels, and soon after the high-tensile "silicon" steel followed by the chromium-manganese-silicon steel under the trade name Cromansil. The 1 per cent copper steels also can be included in this classification.

In recent years other low-alloy steels have been placed on the market so that the number has grown to nearly a dozen of varying compositions, properties and claims. In general, these steels can be divided into two classes: (1) Corrosive in the atmosphere; and (2) moderately noncorrosive in the atmosphere.

Tensile strength averages approximately from 75,000 to 100,000 pounds per square inch "as-rolled," with good ductility and high elastic limit. Some of them possess excellent welding properties and fatigue resistance. In general, alloying elements total less than 4 per cent, in some cases much less.

Principal applications at present are for structural use in ships, cars, bridges, tanks and boilers, where lighter structures with increased strength are sought.

It is the object of this article to present a review of the leading types of these steels which shall include, so far as available, their composition, physical properties and also some of the claims made. Comparisons are not intended—these are left to the reader.

Types To Be Discussed

The steels to be discussed, more or less in the order in which they originate, are as follows:

Low-nickel
Medium manganese
High tensile "silicon"
Copper steel (1.25-1.75 per cent)
"Cromansil"
Chromium-vanadium
Carbon-vanadium
Manganese-vanadium
Manganese-molybdenum
High-"silicon" plus molybdenum
"Cor-Ten"
"Man-Ten"
"Sil-Ten"

Another steel, said to be under consideration for this class by a large steel company, is a 1.00 to 1.25 per cent copper steel with 0.20 to 0.30 per cent molybdenum. Still another

Table I

Test Results on 3.5 Per Cent Nickel Steels, As Rolled

Size	Carbon, %	Yield point, lbs./sq. in.	Tensile strength, lbs./sq. in.	Elongation, per cent in 2 ins.	Elongation, per cent in 8 ins.	Red. of area, %	Izod impact, ft.-lbs.
½-inch Plate	0.32	62,300	101,900	33.5	20.4	47.4	55.5
½-inch Plate	0.32	61,700	102,100	35.5	19.1	44.3	56.5
1½-inch Round	0.40	72,000	110,000	21.0	.....	44.0	.....
1½-inch Round	0.30	65,000	95,000	24.0	.....	46.0	.....
½-inch Plate	0.26	56,600	82,000	43.5	25.8	50.7	65.0
1¼-inch Round	0.20	60,000	90,000	25.0	.....	50.0	.....
1½-inch Round	0.20	58,000	85,000	27.0	.....	58.0	.....
1¼-inch Round	0.20	52,600	80,360	27.3	.....	58.5	.....

is a 1.25 to 1.75 per cent copper steel with a small amount of nickel.

Nickel Steels

Nickel steels for structural shapes are advocated where a high strength, highly fatigue resistant material of marked toughness and resistance to impact is desired. The higher carbon ranges provide large strength increases over that of ordinary structural steel while the lower carbon ranges offer more moderate strengthening with special emphasis on the toughness and fatigue resisting features.

Two grades of such steel are in general use for structural purposes. One contains about 3.5 per cent nickel with carbon as required; the other, which shows comparable properties and is somewhat cheaper to make, contains a minimum of 2 per cent nickel and a maximum of 1 per cent manganese.

Nickel steel, 3.5 per cent: This grade with 0.30 to 0.40 per cent carbon can be guaranteed to meet the following minimum properties: Yield point 55,000, and tensile strength 85,000-100,000 pounds per square inch; elongation in 8 inches, 18 per cent; reduction of area, 40 per cent; and Izod impact value, 40-60 foot-pounds.

Table I shows test results on this steel in the as-rolled condition, data being from the records of the International Nickel Co. Inc., New York.

The average yield point of 257 heats of nickel steel for bridge work was reported to be 62,700 pounds per square inch.

The 2 per cent nickel steels: Some test results on the lower nickel grade in "as rolled" plate are found in table II.

Both grades of nickel structural steel are amenable to heat treatment when even better combinations of properties are required. The 0.30 to 0.40 per cent carbon, 3.5 per cent nickel steel, oil quenched and drawn at 1000 degrees Fahr., will approximate the following values: Yield point 88,000, and tensile strength 115,000 pounds per square inch; elongation in 8 inches, 20 per cent; reduction of area, 60 per cent; and Izod impact value, 70 foot-pounds.

Recently considerable work has been done in regard to the welding of these nickel steels. As a result, there are now several commercial wires on the market which produce a 100 per cent weld, according to the International Nickel Co.

Medium Manganese Steels

The so-called "medium" or "intermediate" manganese steels have become widely used in recent years. They range from 1.00 to 1.75 per cent manganese with varying percentages of carbon (0.10 to 0.70 per cent). Tensile strengths average from 85,000 to 120,000 pounds per square inch, with yield points from 65,000 to at least 90,000 pounds per square inch, after heat treatment. The ductility of some of these steels is excellent.

The application of these steels has been confined largely to heat treated products such as forgings. One automobile company employs these types exclusively in many of its alloy steel parts.

In the "as-rolled" condition, these steels have found some use but not to the extent of some of the other low-alloy steels. A steel of this class (0.30 per cent carbon and 1.50 per cent manganese) has approximately a yield point of 60,000 pounds per square inch and a tensile strength of 95,000 pounds per square inch with an elongation in 2 inches of 24 per cent and a reduction of area of 55 per cent.

Silicon and Copper Steels

Some years ago a steel was announced in Germany under the name Freund steel. It originally contained 1 per cent silicon with manganese about normal. It is understood that this was not a success. Later it was modified to a 1 per cent, maximum, manganese steel with silicon about 0.30 per cent, maximum. Later this steel, particularly in this country, came to have the name "high-silicon" structural steel. It has been and is being used extensively in bridges.

While this is not strictly an alloy steel, in the generally accepted definition of that term, it is included here for obvious reasons. There are many modifications of this general composition as to silicon and manganese, even with additions of other alloys in small quantities. They are being recommended for use in the as-rolled condition and in competition with other and later steels in the low-alloy, high-tensile class.

The American Society for Testing Materials has adopted specifications for this steel, as follows:

Carbon .....0.40 per cent, max.
Silicon .....0.20 per cent, min.
Manganese .....1.00 per cent, max.
Copper (when specified)....0.20 per cent

Tensile strength...80,000–95,000 lbs./sq. in.
Yield point .....45,000 lbs./sq. in., min
Elongation in 8 in.....1,500,000/tensile str.

About 30 years ago a steel was introduced by one of the older Amer-

Table II

Properties of 2 Per Cent Nickel Steel, As Rolled

Yield point, lbs./sq. in.	Tensile strength, lbs./sq. in.	Elong. in 8", %	Red. area, %	Izod impact, ft. lbs.	Chemical composition, per cent C	Mn	P	S	Si	Ni
Plate, ⅜-inch:			*For Boiler Plate*							
56,240	81,060	26.0	54.3	.....	0.21	0.60	0.011	0.038	0.15	2.07
53,950	80,060	25.0	55.1	.....	0.20	0.55	0.014	0.032	0.15	2.17
55,000	81,680	21.0	53 3	.....	0.20	0.55	0.010	0.030	0.19	2.17
Plate, ¾-inch:										
48,500	76,000	28.8	59.4	65.0	0.19	0.67	0.018	0.024	0.21	2.16
Plate, ¾-inch:			*For Bridge Plate*							
66,840	106,300	17.8	37.4	.....	0.29	1.09	0.025	0.030	0.26	2.01
63,980	104,200	19.5	44.7	.....	0.31	1.08	0.040	0.032	0.26	2.04
64,620	99,620	19.5	42.5	.....	0.28	1.01	0.042	0.050	0.32	2.12
Plate, 1⅜-inch:			*For Oil Refinery*							
56,700	91,400	21.0	.....	.....	0.24	0.70	0.018	0.021	0.24	2.35
54,200	85,100	22.0	.....	.....	0.25	0.60	0.010	0.022	0.22	2.34
50,200	83,100	26.5	.....	.....	0.23	0.65	0.012	0.021	0.22	2.44
Plate, ½-inch:			*For Ship Plate*							
55,300	88,500	23.0	48.8	70.5	0.26	0.76	0.028	0.033	0.14	2.46
55,300	91,500	19.2	59.5	.....	0.21	0.83	.....	.....	.....	2.62
Plate, 11/16-inch:										
54,000	83,500	22.5	53.5	.....	0.21	0.82	0.042	0.022	0.24	2.71

ican companies which has much the same composition as some other present-day so-called silicon high-strength steels. It was early used as a spring steel.

The copper (low-alloy) steels are neither so well-known nor so extensively used as some of the other steels. It is known that additions of copper from 0.50 to 1.75 per cent enhance the physical properties, particularly the tensile strength, of plain carbon steels. These steels have not yet been commercially tested and applied in the as-rolled condition to any extent but their investigation is proceeding rapidly. Where surface finish is a prime consideration, there are usually added small percentages of nickel with the copper. It is expected that the 1.25 to 1.75 per cent copper steels (with nickel) will be heard from in the growing competition among the low-alloy high-tensile steels.

Cromansil steel—named from its three principal alloying ingredients, chromium, manganese, and silicon—was developed by the Electro Metallurgical Co., New York, to replace carbon steels in applications where a steel having a combination of high strength and good ductility in the as-rolled condition is required.

In general, the composition of Cromansil steel has the following range:

	Per cent
Chromium	0.40 - 0.60
Manganese	1.10 - 1.40
Silicon	0.60 - 0.90

The carbon content may be varied, depending on the physical properties desired and the thickness of the section. For general use, when this steel is to be cold-worked, machined or welded, the most satisfactory results have been obtained with a carbon of 0.15 to 0.25 per cent. Actual commercial test results of Cromansil steels are given in Table III. These give a comprehensive idea of the possibilities claimed for these steels of varying compositions.

Tests made in a Farmer rotating-beam testing machine show that this steel has a fatigue limit of 50 to 60 per cent of the ultimate tensile strength while for plain carbon steel it is only about 40 to 50 per cent. Other tests show that Izod impact values per square centimeter range from 20 to 64 foot-pounds depending on the size of the section examined.

Vanadium Steels

In the low-alloy high-tensile field there are three principal compositions, carbon-vanadium, chromium-vanadium, and manganese-vanadium steels.

Carbon-vanadium steel: This type of steel is not as extensively used in the as-rolled condition for structural applications as the chromium-vanadium or manganese-vanadium steels. One of its principal applications is for large hammer welded tanks. It has decidedly enhanced physical and other properties compared to those of plain carbon steel. In the as-rolled condition, at other than excessive temperatures, this steel exhibits a finer and more uniform grain size than similar steels not containing vanadium.

In composition, this steel corresponds to the usual carbon plate and structural steels, with the addition of from 0.10 to 0.18 per cent vanadium. The range in physical properties in the as-rolled condition for plates with about 0.20 per cent carbon and manganese 0.45 to 0.75 per cent would be, depending upon the percentage of vanadium present and thickness of the plate, as follows:

Tensile strength...65,000–75,000 lbs./sq. in.
Yield point .....40,000–50,000 lbs./sq. in.
Elongation, 8 inches.....30–20 per cent
Reduction of area.....60–50 per cent
Brinell hardness 126–146

Table III

Physical Properties of Cromansil Steels

Plate size, inches	Per cent C	Cr	Mn	Si	Yield point, lbs./sq. in.	Tensile strength, lbs./sq. in.	Elong. % in 8 in.	Red. of area, %	Brinell hardness	Izod impact, ft.-lbs.
¾	0.09	0.48	1.47	0.54	48,000	75,000	30.0	61.0	150	....
¼	0.15	0.23	1.26	0.78	62,000	85,000	21.0	.....	.....	....
⅜	0.20	0.49	1.27	0.92	67,000	95,000	20.0	44.0	200	....
¾	0.20	0.49	1.27	0.92	63,000	98,000	21.0	52.0	200	....
1½	0.20	0.49	1.27	0.92	68,000	96,000	21.0	52.0	200	....
½	0.21	0.47	1.17	0.72	50,000	92,000	20.0	56.0	210	36
1	0.21	0.47	1.17	0.72	51,000	99,000	16.0	.....	210	25
1½	0.21	0.47	1.17	0.72	56,000	89,000	19.0	.....	210	24
2	0.21	0.47	1.17	0.72	53,000	86,000	20.0	.....	210	20
½	0.21	0.62	1.24	0.71	56,000	87,000	21.0	55.0	185	....
1	0.26	0.52	1.10	0.74	59,000	96,000	28.0*	63.0	.....	....
¾	0.30	0.45	1.39	0.86	65,000	114,000	20.0*	47.0	230	....
¾	0.39	0.50	1.41	0.81	67,000	128,000	16.0	43.0	270	....
⅜	0.46	0.67	1.19	0.82	91,000	143,000	19.0*	.....	270	20

*Per cent in 2 inches.

Table IV

Average Physical Properties of Chrome-Vanadium Steel Plates After Annealing

Carbon, per cent	Plate thickness, in.	Tensile strength, lbs./sq. in.	Yield point, lbs./sq. in.	Elong., % in 8"	Red. of area, %
0.25	1½	104,000	70,000	18	50
0.25	¾	124,000	80,000	15	40
0.15	¾	85,000	55,000	20	55
0.15	⅜	.....	58,000	20	55

Table V

Properties of Low-Alloy Molybdenum Steels, As Rolled

Manganese-Molybdenum

Chemical composition, % C	Mn	Si	Mo	Plate, in.	Yield point, lbs./sq. in.	Tensile strength, lbs./sq. in.	Elongation, % in 8"
0.13	0.90	0.21	0.48	15/16	48,400	75,350	27.0
0.16	0.78	0.19	0.46	¾	49,000	78,900	25.0
0.10	1.05	0.21	0.42	½	54,500	76,200	21.0
0.15	1.59	0.42	0.35	½	66,850	98,760	15.0

Charpy impact tests of the first two steels were 20 foot-pounds as-rolled and 35 foot-pounds normalized.

"High-Silicon" with Molybdenum

Chemical composition, % C	Mn	Si	Mo	Cu	Plate, in.	Yield point, lbs./sq. in.	Tensile strength, lbs./sq. in.	Elongation, % in 8"
0.28	0.86	0.22	0.22	.....	¾	56,720	88,260	19.75
0.32	0.77	0.26	0.20	0.27	¾	56,190	89,400	20.20
0.33*	0.87	0.29	.....	0.26	½	48,030	86,030	20.60

*Standard "silicon" bridge steel.

Table VI

Properties of Special USS High-Tensile Steels

Chemical:	Regular open-hearth	Cor-Ten	Man-Ten	Sil-Ten
	Per cent			
Carbon	0.10	0.10	0.35	0.40
Manganese	0.50	0.10-0.30	1.25-1.70	0.70-0.90
Phosphorus	0.04	0.10-0.20	0.04	0.04
Sulphur	0.05	0.05	0.05	0.05
Silicon	0.10	0.50-1.00	0.15*	0.20-0.30
Copper	0.20**	0.30-0.50	0.20**	.....
Chromium	.....	0.50-1.50	.....	.....

*Maximum, if no range or other limit is indicated.
**Minimum, if copper is specified.

Physical:	Regular open-hearth	Cor-Ten	Man-Ten	Sil-Ten
Yield point, lbs./sq. in.	25,000-35,000	50,000-60,000	55,000-65,000	45,000
Tensile strength, lbs./sq. in.	35,000-50,000	65,000-75,000	80,000-90,000	80,000-95,000
Elongation in 2 in., per cent	34-25	27-22	25-20	23-18
Izod impact, ft.-lbs.	30	60	40	....
Endurance limit, lbs./sq. in.	25,000	45,000	40,000	....

Modulus of elasticity—28,000,000-30,000,000.
Impact and endurance values only approximate.
Ranges of physical properties are minima and cover possible sheet treatments.
Regular open-hearth included only for comparison.

Chromium-vanadium steel: This steel has found its principal use in the as-rolled condition as plates for electrically welded tanks for transporting gases under pressure, and electrically welded reaction chambers for chemical and oil industries.

The composition of this type of vanadium steel in general use for such purposes corresponds to S. A. E. 6120 steel, ranging from 0.15 to 0.25 per cent carbon, 0.80 to 1.10 per cent chromium, 0.50 to 0.80 manganese, and 0.15 minimum vanadium. Electrically welded tanks and vessels are usually given an annealing treatment at about 1150 degrees Fahr. The physical properties of chromium-vanadium plates after such an annealing would have about the average values shown in table IV.

Manganese-vanadium steel: This steel, which is the most important of the low-alloy high-tensile steels in the as-rolled condition, is a low-carbon medium-manganese steel to which a small percentage of vanadium has been added. Its principal application has been for structural plates and shapes. Typical of the specifications for this steel are those recently issued by the navy department:

	Per cent
Carbon	0.18 max.
Manganese	1.45 max.
Silicon	0.25 min.
Sulphur	0.25 max.
Phosphorus	0.04 max.
Vanadium	0.08 min. to 0.18 max.
Copper	0.20 max.

Plates ranging from ½-inch to ¾-inch in thickness to the above chemical limits will show the following physical properties:

Tensile strength.....80,000 lbs./sq. in., min.
Yield point.....50,000 lbs./sq. in., min.
Elongation in 8 in.....20 per cent, min.

The steel also has high impact and endurance values. It has excellent welding qualities, and welds retain the inherent toughness of the steel to a remarkable extent, according to the Vanadium Corp. of America, New York, from which this information was obtained.

Molybdenum Steels

As in the case of vanadium, there are two low-alloy high-tensile steels containing molybdenum—manganese-molybdenum and carbon-molybdenum. In composition they are similar. There is also a so-called "high-silicon" steel to which molybdenum is added.

Manganese-molybdenum. The most interesting and important of these low-alloy molybdenum steels is the manganese-molybdenum. It is pointed to by the Climax Molybdenum Co., New York, as "a finely weldable, high-strength structural steel of exceptional grade and utility."

Physical properties and analyses, selected from records of basic open-hearth heats and reproduced in table V, are indicative of the possibilities of this steel.

"High-silicon" with molybdenum: By adding about 0.25 per cent molybdenum to the "high silicon" (yield point 45,000 pounds per square inch minimum), a steel is claimed which is as easily produced but more easily fabricated than the silicon steel. It is "a reasonable cost, most dependably satisfactory high-strength bridge steel and is recommended for all riveted rather than welded construction in which properties of this character are desired." Commercial test results are shown in table V.

Carbon-molybdenum: This steel is a plain medium or low-carbon steel containing about 0.20 to 0.30 per cent molybdenum. While this grade has not yet been used commercially as a structural steel, it is pointed to as capable of meeting the general specifications for the low-alloy high-strength steels.

Another molybdenum steel which is expected to come under the general classification discussed in this article is the copper-molybdenum type. The molybdenum in this grade ranges from 0.20 to 0.30 per cent with the copper either 0.30 to 0.50 per cent or as high as 1.25 to 1.75 per cent with the carbon in low range.

Special group—USS Cor-Ten, Man-Ten and Sil-Ten

Announcement recently by the United States Steel Corp. New York, of a group of special low-alloy high-tensile steels has whetted interest in this type of material. The Corporation has, after considerable research, perfected and adopted this special group which it offers as USS high-tensile steels. It is an interesting fact that this is the only steel company which is promoting its own steels—the others discussed in this review are the offerings of special alloy producing companies. It is claimed these steels, as given in table VI, meet in general most or all of the requirements outlined in the introduction of this article.

It will be seen that there is a wide range of physical properties available. Cor-Ten is a chromium-silicon-copper alloy steel, low in carbon. It is a patented steel, a feature of which is its high phosphorus content. Man-Ten is a medium manganese steel usually containing cop-

(*Please turn to Page* 66)

Table VII

German Low-Alloy High-Strength Steels

	Chemical composition, per cent				
	Si	Mn	Cu	Cr	Mo
Standard cupriferous	0.80-1.10	0.75-0.90	0.25-0.40	.....	.....
Lauchhammer structural	0.50-0.70	0.90-1.10	0.50-0.60	.....	.....
Krupp	0.30-0.50	1.20-1.60	0.30-0.60	.....	.....
Union	0.30-0.50	0.70-1.00	0.60-1.00	0.40-0.60	.....
G. H. H.	0.50 max.	1.00-1.30	0.35 min.	.....	0.15-0.25

Carbon in these steels: 0.12 to 0.15 per cent.
Tensile strength averages 75,000 to 90,000 lbs. per sq. in.

To Production Executives

Sunoco Helps You Secure ..Rated Machine Tool Capacity ..at Minimum Cost

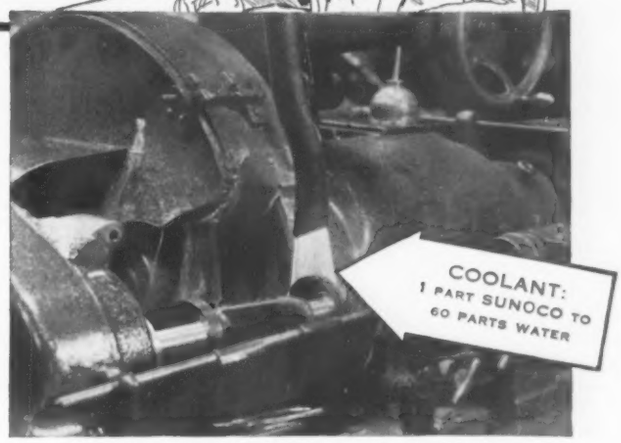
IN your efforts to lower machining costs, don't overlook the real importance of an efficient cutting lubricant. Without it, machine tools will not operate at rated capacity. And it is significant that machine tool manufacturers use and recommend Sunoco Emulsifying Cutting Oil.

Faster and Deeper Cuts Made Possible

With the aid of Sunoco, many executives have definitely increased machine hour production. Faster and deeper cuts are possible. Work is kept cooler. Accuracy and finish, even at higher speeds, are kept at the same high plane. Longer runs between tool grinds and less lost time for re-setting, too, make for economy.

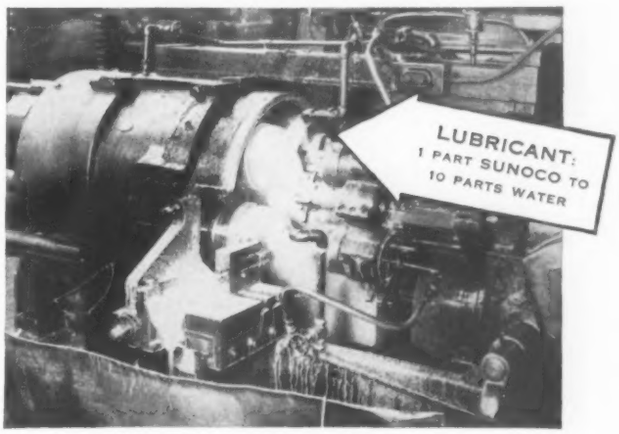
The ability to estimate the production capacities of cutters, drills, taps, reamers and other small tool equipment, is a valuable aid in computing manufacturing costs. The uniformity of Sunoco permits accurate prediction on the quantity of work that machine tools will produce.

It will pay you to get the facts on Sunoco. Tests in your plant will gladly be made, and our experienced cutting oil engineers are at your service.



Courtesy of **MUSKEGON MOTOR SPECIALTY Co.**
Jackson, Mich.

OPERATION: FINISH GRIND, CRANKSHAFT CENTER MAIN BEARING, PLUNGER CUT
MACHINE: LANDIS GRINDER
MATERIAL: H. R. TYPE "E. E." STEEL
SPINDLE SPEED: 750 R.P.M.
WHEEL SIZE: 30 INCH DIAM., 2.188 INCH FACE.
STOCK REMOVAL: .025 INCH.
PRODUCTION: 40 PER HOUR.



Courtesy of **NATIONAL ACME** *Co., Cleveland, Ohio*

OPERATION: ROUGH BORE AND ROUGH TURN STEEL FORGING.
MACHINE: GRIDLEY 4-SPINDLE, 4½ INCH CHUCKING MACHINE.
SPINDLE SPEED: 160 R.P.M.
BORE: 129 FEET PER MINUTE.
TURN: 114 FEET PER MINUTE.

SUNOCO
EMULSIFYING
CUTTING OIL

Made by the producers of BLUE SUNOCO MOTOR FUEL

NRA

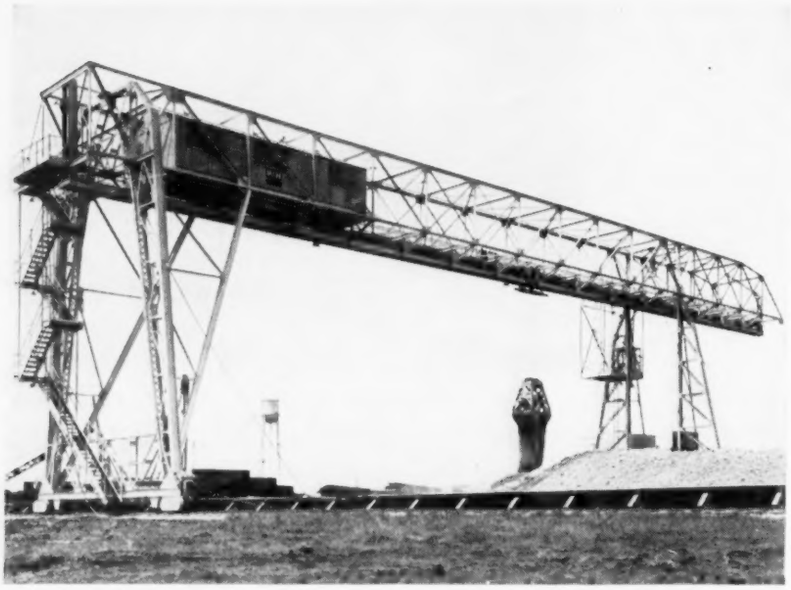
SUN OIL COMPANY
PHILADELPHIA

Offices and Warehouses in More Than 100 Cities

Subsidiary Companies: Sun Oil Co., Ltd., Montreal
British Sun Oil Co., Ltd., London, Eng.

Hardfacing Prolongs Life of Drum Forming Machinery

Gratifying results have been obtained by hard facing dies and parts of machinery subject to excessive wear at the plant of a large producer of calcium carbide. Hard faced shear blades, drill bits, knives, heavy-duty hooks, and dies of all kinds are used in the production of steel drums. One particularly successful application is the hard facing of a double seamer head which is part of a drum making automatic double seamer. This hard-faced head was in continuous service from April 10, 1933, until April 18, 1934, and during that period completed the double seams on both the tops and bottoms of 415,557 100-pound drums. The head is made of mild steel with stellite applied to the wearing or seaming edge. Cost of making up this head, including all labor and material, was approximately $14.50. Previously these heads were made of various grades of tool steel at a cost of approximately $13.71 each, including labor and material, and lasted an average of from 3 to 4 months. The tool steel heads, when worn below standard, were discarded and replaced with new ones. The hard-faced head, however, has been reconditioned by applying more stellite and regrinding to standard gage at a cost of approximately $9.50. It has been put back into service, and, in fact, is just as serviceable as a new head.



CRANE HANDLES SULPHUR FROM BARGE TO OCEAN BOAT: In operation at the shipping terminal of the Freeport Sulphur Co., Grandesport, La., about 50 miles south of New Orleans, this large crane reclaims sulphur unloaded on docks from river barges and by means of an inbuilt hopper and belt conveyor, transfers the material over the top of the Mississippi levee to be loaded directly into holds of seagoing vessels. Reclaiming capacity is 400 long tons per hour. Not long ago the Freeport company made the first shipment from its new 1000-foot docks at Grandesport when 2500 tons of sulphur was loaded for Glasgow, Scotland. The crane was built by the Harnischfeger Corp., Milwaukee, all track wheels being motor driven because of high winds which prevail along the Gulf coast

$ $ $

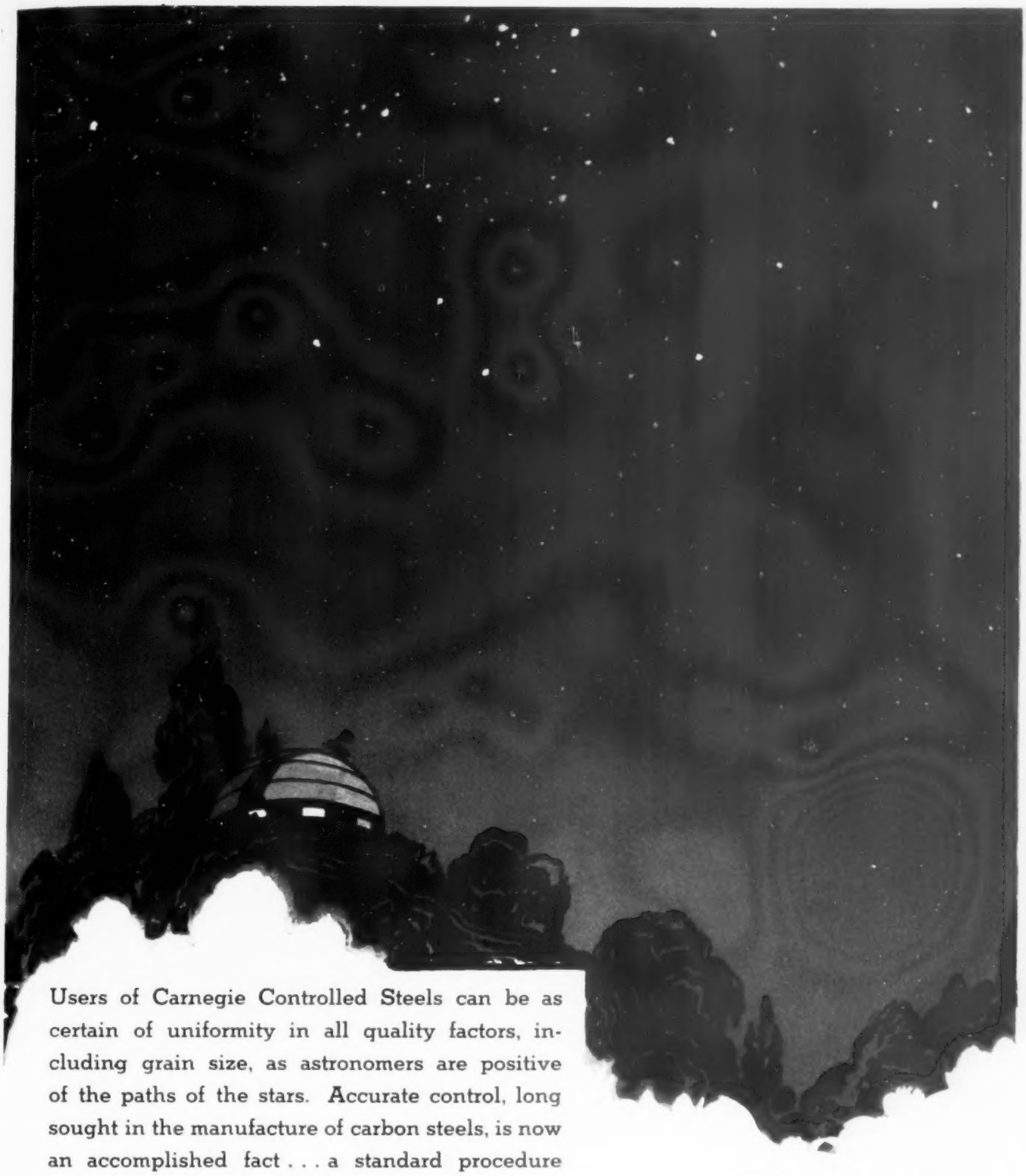
Aluminum in Zinc Anodes Avoids Sludge Formation

A study of zinc anodes for plating, according to a manufacturer of equipment for controlling the analyses of plating solutions, shows an anode containing 0.5 per cent aluminum and 0.5 per cent mercury is sludge free and has a constant anode polarization in cold or warm cyanide baths, with current densities up to 30 amperes per square foot. Pure zinc and mercury zinc anodes form sludge and have variable polarization plating. Roughness of the deposit varies with the sludging tendencies of the anode.

$ $ $

Jig Design Is Important Factor in Welding Sheets

Importance of the proper design of jigs for repetitive welding work can hardly be overemphasized as it is a consideration which bears directly on the production cost of any welded article. It is one of the most highly important phases of fabrication work on sheet metal articles. Convenience to the operator, reduction in cost of the articles, standardization of the article, and accuracy in fabrication, are the all-important features that result from good jigging practices. Probably in the welding of formed sheet metal articles these factors are of even greater importance than in any other type of welded production. In this work, deviation of even a



Users of Carnegie Controlled Steels can be as certain of uniformity in all quality factors, including grain size, as astronomers are positive of the paths of the stars. Accurate control, long sought in the manufacture of carbon steels, is now an accomplished fact . . . a standard procedure with Carnegie. Our metallurgists will be glad to discuss this important development with you.

SEE OUR EXIBIT at the
National Metal Exposition
Oct. 1-5 • New York City

280

CARNEGIE *Controlled* STEELS

Product of CARNEGIE STEEL COMPANY • *Subsidiary of United States Steel Corporation* • PITTSBURGH, PA.

minute fraction of an inch may result in warping of the material, cause unsightly joints, and in general defeat the purpose of the use of the oxyacetylene welding process.

\$ \$ \$

Treatment of Nitrided Dies

Although nitrided steel dies for drawing sheet steel and strip have excellent abrasion resisting properties, they require a considerable period for heat treatment and they are difficult to alter. Since many dies reach their final form empirically, several changes may be made before satisfactory results are obtained. Nitrided steel becomes soft when ground and consequently is not suitable when alterations are to be made. In replacing a die the shape of which has proved satisfactory, however, it may be used to advantage, especially on deep drawn work.

\$ \$ \$

Hard bronzes are used by a large automobile body manufacturer as inserts to prevent cold welding of forming dies and work stock which occurs in some cases when steel is employed for both. While some hardness is sacrificed by the use of bronze, this material permits the stock to slide over it freely, preventing pick-up and scoring.

Blown-Up Trademarks Create Business For Steel Fabricating Shops

BLOWN-UP trade marks are coming into more general use and consuming an increasing tonnage of steel. An interesting installation of this kind is in connection with a new filling station operated by the Richfield Oil Co. of California at Westwood Village, near the University of California, Los Angeles. This unusual station, shown in the accompanying illustration, was designed under the supervision of Charles L. Shaffer, manager of engineering for the Richfield Oil Co. of California, and his assistant A. F. Ross.

The eagle surmounting this station is 16 feet high and nearly 10 feet from beak to tail, with free standing wings 4 feet wide and only 10 inches thick at the base. This construction involved a problem of framing to preserve the proper outline of contour in withstanding wind pressure of 30 pounds per square foot. Each wing is carried by a main cantilever member built of four 2 x 2 x ¼-inch angles tied together by plate gussets and spacers and anchored into a heavy plate across the bird's shoulders, and into an auxiliary beam supported at the outer end of the cantilever and at the lower trailing edge of the wing. The head and neck were built into a single line structure of welded formed sheets with no structural stiffening and supported on a flange ring at the bird's shoulders.

About 1800 pounds of steel sheets were used in constructing this blown-up trade mark. The material was enameling stock supplied by the American Rolling Mill Co., Middletown, O. It is enameled in two shades of blue with some black trim. The sheets, from which the wings and body were made, were formed to shape, enameled and attached to the frame by screws and washers. The detailed design and construction of the eagle together with the structural work were worked out and accomplished by the Smooth-Holman Co. of Inglewood, Calif., fabricator and porcelain enameler. Three smaller models each 9 feet high and weighing about 700 pounds have been built and erected in the same manner, one in Beverly Hills, one in San Francisco, and one in Portland, Ore.

SURMOUNTING a gasoline filling station of the Richfield Oil Co. of California, at Westwood Village near Los Angeles, is a notable example of a blown-up trademark, an eagle, 16 feet high and formed out of sheet steel

Practical View of "Elastic Limit"

TERMS "elastic limit" and "proportional limit" have simple definitions, but their practical determination is complicated by many factors according to a recent paper by J. B. Kommers, professor of mechanics at the University of Wisconsin, Madison, Wis.

Prof. Kommers cites his own results on a series of steels to show that for steel the elastic limit and the proportional limit are nearly identical. His results on a series of brasses show that in making a determination of the elastic limit, the repeated loadings used in making the test may influence the result obtained by changing the material from its original condition.

For wrought iron and steel, the author concludes that the yield point would be satisfactory as an approximate value of elastic strength, while for a more delicate determination a modification of Johnson's elastic limit could be used. For nonferrous metals, such as brasses, bronzes, and aluminum alloys, he suggests that the best solution of a vexing problem is to determine the "yield strength" as proposed by one of the committees of the American Society for Testing Materials. This committee defines "yield strength" as the stress at which a material exhibits a specified limiting permanent set, and suggests a simple manner of determining it.

Discussion of this practical method is regarded as important because of its implications in building and machine work, where the determination of the elastic strength of metals leads to the finding of the stress values of these metals in designing a structure or in making machine parts and therefore are seen as essential to safety.

LARGE USES OF STEEL IN SMALL WAYS

270th Article ◆ Vending Machines

ALTHOUGH rapid growth during the past 15 years in use of automatic vending machines, with their consequent saving of labor, may be regarded as a by-product of the age of mechanization, the origin of this equipment dates back 50 years or more. The earliest mechanical venders of peanuts and chewing gum, along with the penny weighing machine, may be considered as the progenitors of the tens of thousands of robot salesmen now available for dispensing almost an unlimited variety of popular commodities.

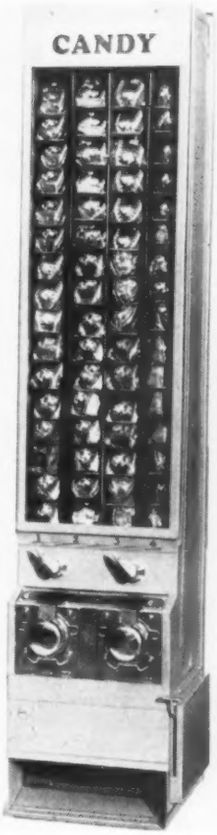
One of the first vending machines was developed by a chewing gum manufacturer nearly half a century ago, when this national habit was only a novelty, as means of introducing and advertising his product. Today the vending machine is invaluable in reducing sales expense in the distribution of small articles as well as in multiplying the places where such miscellaneous products can be purchased.

Saves Wages of Clerk

Many restaurants, theaters and retail establishments, for instance, have found it more economical to install a machine to vend cigarettes or candy than to hire a clerk for such a purpose; in some cases there would be no profit in selling certain articles were it not that the vending machine asks no wage beyond initial cost and maintenance. Usually this equipment is installed and serviced by an operator controlling a number of machines rather than by the establishment in which the unit is located, the latter receiving a certain share of the profit from the sales.

The variety of products currently being distributed by machines ranges from aspirin to apples, from cigarettes and cigars to candy, from golf balls to gum and from peanuts to perfume—to mention only a few. One manufacturer of this equipment has designed and built 115 different types of vending machines and is in a position to adapt features of these to other units capable of exchanging a commodity for a coin.

Manufacture of this equipment has meant a fairly substantial market for the steel industry, particularly for producers of flat-rolled material. During active business years it is estimated that more than 1500 tons of steel has been consumed annually in fabricating all types of vending machines.



—Courtesy Advance Machine Co., Chicago

One of many hundreds of types of automatic vending machines, in which steel is the principal construction material. Weight of this unit is 65 pounds

Illustrated is a typical unit designed to dispense candy. It weighs 65 pounds, practically all of which is steel. The operating mechanism is made principally of brass, some parts being cast. A magnet located in the coin receptacle serves to prevent certain slugs from being accepted in place of a legal coin. Furniture sheets are used in fabricating the case, the various parts being welded together. Generally 14-gage and 18-gage sheets are required for the cabinet.

As a precaution against corrosion, terne plate is employed for the chutes that hold the candy. Terne plate is used for chutes in cigarette, gum and other types of machines as well. Certain units require a quantity of steel wire in their manufacture, while a moderate tonnage of cold-rolled strip also is consumed in making miscellaneous parts.

Use 7500 Gallons of Paint To Protect Steel Bridge

Repainting of the Outerbridge crossing between Perth Amboy, N. J., and Tottenville, Staten Island, N. Y., is requiring the use of something like 7500 gallons of paint. The work is entering its final stage and will be completed in October. Port of New York Authority field forces, which are doing the painting, were called upon to cover 16,000 tons of structural steel stretching a distance of 9000 linear feet.

The main, or overwater, span, was repainted last summer; only the extensive approaches are being done now. Aluminum paint is being used, thereby giving a bright luster to the steel.

This bridge was painted originally in 1927 when the Goethals bridge between Elizabeth, N. J., and Howland Hook, Staten Island, was being built. The latter was repainted a few months prior to the Outerbridge crossing, because atmospheric conditions due to the proximity of certain industries caused more rapid attack on the coating.

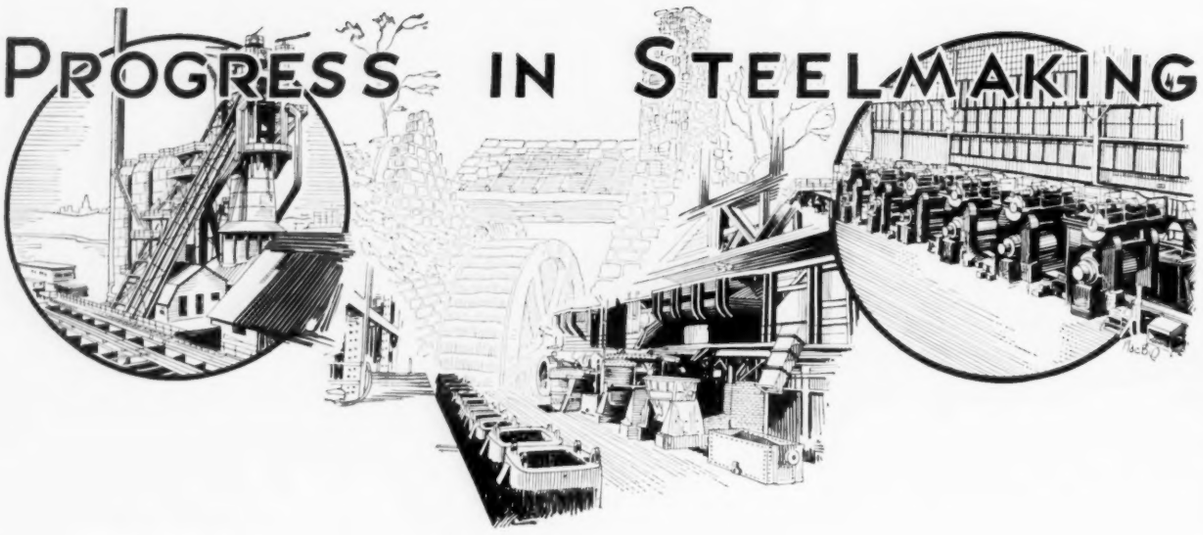
Reports on Research on Corrosion of Tin Plate

With the aim of overcoming the corrosion of tin plate the importance of investigating the electrochemical relations of tin and iron in different liquid media has long been recognized, but interpretation of the work done in the past has been rendered difficult by the peculiar reversal of potential which occurs under certain conditions. Thus, tin is sometimes anodic and sometimes cathodic to iron.

The mechanism of these changes is more clearly understood as a result of recently published research carried out on behalf of the International Tin Research and Development council by Dr. T. P. Hoar at Cambridge university. The work described has a direct bearing on the corrosion of tin plate cans by fruit juices, etc.; and indicates promising lines for future work aiming at reducing the corrosion often encountered in tin plate.

Copies of the publication may be obtained from the International Tin Research and Development council, L. J. Travener, U. S. representative, who may be addressed at 149 Broadway, New York.

PROGRESS IN STEELMAKING



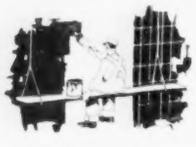
INSULATION applied to the uptakes, checkers and main roof of an open-hearth in the Great Lakes district has been effective in prolonging the life of the furnace and in saving fuel. About 481 heats have been tapped from the furnace with a running repair cost of 3 cents per ton of steel, which is lower than for any other furnace in the plant.

• • •

Through the use of a newly marketed machine which is built with two independently driven wheels and appropriate guide shoes, both sides of narrow strip steel are cleaned and polished simultaneously. In cleaning scale from the strip, set-up wheels with a suitable abrasive glued to their faces are employed, while for polishing, buffing wheels are used. Wheel wear on the unit is compensated through vertical adjustment and guide shoes at each wheel hold the strip in the proper position for the wheel to act upon it.

• • •

Use of alloy nickel and copper for the impeller of a quenching pump at by-product coke ovens prolongs the life of the impellers from six to eight weeks to more than two years and results in an attractive saving.



Surface condition of metal greatly influences the life of paint coatings, according to tests conducted abroad. The study also shows that coatings of paint or zinc adhere better to copper steel than to the surface of ordinary steel.

• • •

That uniform particle size in each layer of the burden is beneficial is disclosed by the operating results at a midwestern blast furnace. The ore used at this stack is separated into three sizes and each is charged separately. With the stack burdened on foundry irons the sizing of ore saved about 500 pounds of coke per ton of iron and increased daily output 110 tons. On basic practice the saving of coke is about 440 pounds per ton of iron and production is increased about 82 tons per day.

• • •

Single tube thermal expansion valves now are being marketed for gas mains 20 to 36 inches diameter at blast furnaces, coke ovens, producer plants, soaking pits, boiler plants, etc. Flexing of a diaphram plate facilitates separation of the two contact edges at the valve seat thus permitting the goggle plate to be swung easily. The units are built for operation either by steam or electrically heated expansion tubes. The electric heater is equipped with a control which automatically cuts off the current when the tube has expanded ⅛-inch, or any preset distance.

• • •

A new alloy steel rolling mill plug for seamless tube mills during its first trial afforded a run of 404 passes per plug at a cost of 18 cents a ton of pipe sized. This compares with an average of eight passes using plugs of another type and a cost of $2.40 a ton of pipe sized. The new steel, which is subjected to recently developed processing and heat-treating operations, has high resistance to wear, breakage, and pickup of scale and other foreign materials. Pipe lengths are more uniform and the quality enhanced because of freedom from internal scratches.

• • •

Lime tanks in wire drawing plants usually are neglected. When the lime solution becomes charged with acid, after long usage, a fresh addition of lime remedies the condition but only for a short period. The best service is rendered by syphoning off the surface water each day for a depth of 18 inches when the lime is settled and replacing it with fresh water. The tank should be emptied at least every three months, fresh lime replacing the discarded. This practice effects a large decrease in the quantity of defective stock.

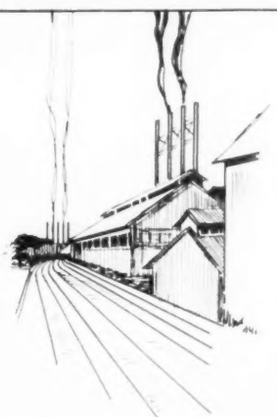
• • •

Fire cracks on the interior surface of ingot molds, which are a function of grain growth in the iron, are minimized when mold iron is low in total carbon and between 0.60 and 0.70 per cent in combined carbon is employed.

• • •

Increasing the output of an open-hearth 10 per cent and decreasing the fuel consumption the same extent are some of the advantages obtained by a steelmaker through the use of 2-pass checkers.

SHEET, TIN AND STRIP MILL EQUIPMENT ★



Continuous Radiant Gap Pair and Pack Heating Furnaces.

Normalizing Furnaces.

Automatic Tinning Equipment—including Pool and Davis Feeders.

Automatic Doublers—Automatic Sheet and Tin Plate Piling Machines.

Wheelabrator Abrasive Cleaning Equipment.

Sheet Galvanizing Equipment.

Patented Cold Reduction Lubricant for Strip Mills.

McKay Strip Processing Uncoiler.

Budd-McKay Sheet Processing Machine.

All the above licensed under Patents and Patents Pending.

Continuous Strip Pickling Equipment including uncoilers, up-cut shears, stitching machines, pinch roll units, recoilers, oiling machines, pickling tanks, and auxiliary equipment.

Scrubbing, Drying, and Oiling Machines for Flat Products.

We specialize in the development and manufacture of finishing machinery and processes for flat rolled products.

THE WEAN ENGINEERING COMPANY, INC.

WARREN, OHIO

Flinn & Dreffein Co. — *Associated Companies* — The McKay Machine Co.

Wide Strip Mills Reach Height Of Technical Development

SINCE the first of this year interest in hot strip mills for production of plate, wide strip for automobile sheets and strip for cold rolling to tin plate gages has been most unusual, stated Walter H. Burr, mechanical and electrical superintendent, Lukens Steel Co., Coatesville, Pa., in opening the thirtieth annual meeting of the Association of Iron and Steel Electrical Engineers, at Hotel Statler, Cleveland, Sept. 18.

In discussing developments in the iron and steel industries for 1933 and 1934, Mr. Burr described an 1800 revolutions per minute steam turbine which now is under construction and is rated at 165,000 kilowatts. Steam is received in the high pressure cylinder at 375 pounds pressure and at a temperature of 825 degrees Fahr.

The speaker directed attention to a 200,000 ampere welding transformer which was built this year and which will be used on the largest pipe welding machine in the world. The use of thyratron control of resistance welding, both seam and spot, has been extended greatly during the year. Mr. Burr directed attention to the unusual oil circuit breakers which protect the transmission lines from Boulder Dam to Los Angeles, pointing out that they will be used at a higher voltage than any previous breakers. The speaker, in conclusion, mentioned that in his opinion inspection will play a large part in the future program of steelmaking in giving consumers the product they desire.

Cites Early Characteristics

Stephen Badlam, consulting engineer, Pittsburgh, in presenting a paper on "A Review of Sheet, Tin and Strip Mills" cited the characteristics in the construction of these mills since 1926. He pointed out that the first stage was one of pioneering. During the second stage, between 1928 and 1929, the field broadened somewhat. During the third phase, between 1931 and 1932, not only was the number of mills increased but the width and gage of product rolled as well. Broad strip mills built up to 1932 showed a wide variation in construction, the speaker pointed out. Roughing stands varied in arrangement and finishing stands showed somewhat of a closer standardization.

The speaker emphasized that 1932 marked the close of the technical development of broad strip mills, and in conclusion mentioned that the great problem of hot strip mills today is the rolling of a product of automobile gages up to a width of 100 inches. Whether this will be done in coils or not, he concluded, is something on which the steel industry will be glad to have more light.

A speaker, in commenting on this paper, brought out the fact that all new wide strip mills have scale breakers in front of the roughing mill, the scale being broken by hydraulic means and affording a clean smooth surface. Early mills, he stated, had difficulty in getting rid of scale. The hydraulic pressure was limited to 500 pounds at that time but under present operating practice 1000 pounds is well standardized.

ON THIS and following pages 56, 59, 60 and 62, STEEL presents first-hand reports of meetings of various divisions of the Association of Iron and Steel Electrical Engineers held last week at Hotel Statler, Cleveland, together with a description of exhibits in the concurrent iron and steel exposition in Public auditorium. Further reports of technical sessions will appear next week.

Fundamentally, the rolling of merchant sections still is an art rather than an exact science and the skill and experience of the roller plays an important part in the successful performance of the mill, according to R. H. Wright, general engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in speaking on "Electrical Equipment for High-Speed Precision Merchant Mills."

In discussing the duty of an electrical engineer in laying out a merchant mill, Mr. Wright mentioned that the former procedure was to lay out the motors to suit a certain rolling schedule. This procedure, however, seldom was effective because the mill was not always operated according to that schedule. Rolling can be made more uniform, he stated, but as the speeds increase it will be necessary to have more uniform procedure in the way of closer co-operation between the roll designer, the roller and the engineer. He emphasized the most important thing in selecting motors is to obtain the correct speed range first.

Describing the drive on vertical mills, the speaker emphasized that vibration is a problem requiring special precaution. In the so-called precision stands, rolls should be ground carefully if they are to function properly. In conclusion the speaker mentioned that the groundwork has been done leading up to ultra-modern bar mills and the only thing remaining is to combine what has been accomplished.

In commenting on Mr. Wright's paper one speaker emphasized that motor speeds should be maintained as close as possible to a ratio of 2 to 1 and that the roughing stands should be driven by individual motors.

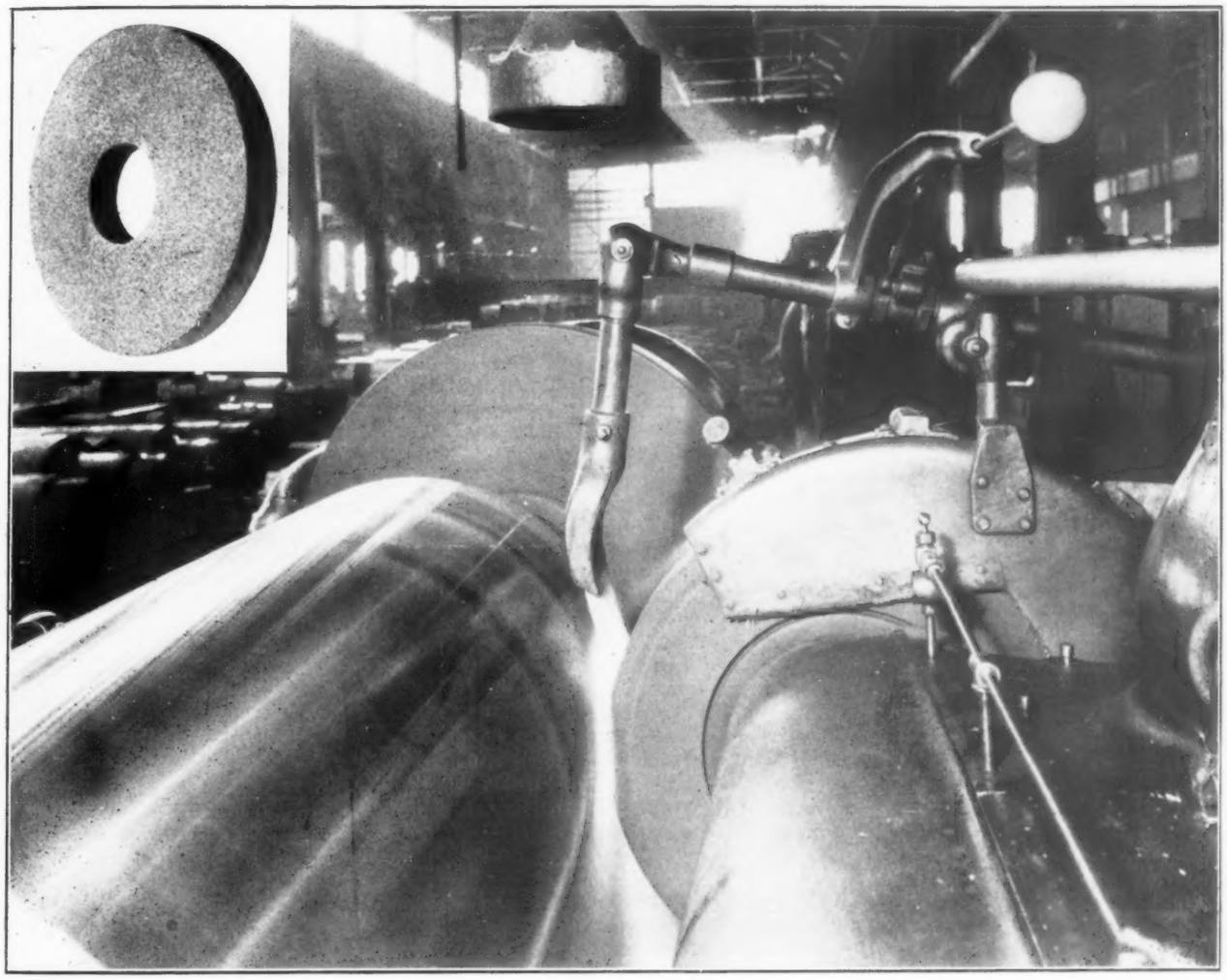
PROPER equipment must be available to obtain an accurate product on either a continuous or semi-continuous type of merchant mill, stated S. M. Weckstein, assistant chief engineer, Timken Roller Bearing Co., Canton, O., in speaking on "Precision Rolling Mills." The delivery of an accurate round from the finishing stand is dependent upon the delivery of an exact section from the next preceding stand of rolls and this section in turn is dependent upon the delivering of an accurate section from the preceding stands in the mill. In order to assure accuracy of the finished product, the speaker emphasized that considerable skill is required on the part of the operator in adjusting the sections in the various roll stands.

Adjustments Are Related

Since the product of the section area and the delivery speed must be a constant for all the roll stands, he pointed out, it readily can be seen that an adjustment in section in any stand of rolls must be accompanied by a corresponding adjustment in roll speed. It is in the maintenance of this accuracy and in the relieve of the operator from the necessity of constant pass readjustment that tapered roller bearings play an important part. By the use of roller bearings, he contended, it is possible to obtain pefect alignment and setting of the rolls and to maintain this setting indefinitely. Once adjusted, the operator can be sure that the rolls will stay put and the only adjustments which he need consider are those required to compensate for wear in the roll passes. With this close control in the roughing and finishing stands a quality product is assured. The speaker by means of slides, showed many successful methods of applying tapered roller bearings on roughing, intermediate and finishing mills and discussed these in detail.

In discussing "Mechanical Billet Chipping" G. W. Lentz, consulting, designing, developing engineer, Canton, O., stated that this means of cleaning carried the lowest tool cost of any known method of surface treatment. This principle of cleaning,

MACKLIN
ROLL GRINDING
WHEELS



SMOOTH . . . . . ACCURATE . . . . . POWERFUL . . . . . FAST—These four truthful words tell the story of Macklin Roll Grinding Wheels, used by many of the largest mills and machine shops in the country. Note the ease and scientific skill with which Macklin Roll Grinding Wheels are operated by the Mesta Machine Company, Pittsburgh, Pa. They will do as well for you. Let us tell you more.

MACKLIN COMPANY

Manufacturers of GRINDING WHEELS

Jackson, Michigan, U. S. A.

Sales Offices:—Chicago — New York — Detroit — Pittsburgh — Cleveland — Milwaukee

the speaker pointed out, has a revolving head with six 2-inch wide cutting tools revolving at a speed of 6 2/3 revolutions per minute, giving 40 cutting cycles per minute. The tool can be raised or lowered, moved forward or reversed while the head is revolving. The cut can be changed from 1/64-inch deep to ⅜-inch between tool contacts with the metal.

The disks are made of high-speed steel, ¾ x 2 x 8 inches and are hardened throughout and ground on one end. Best results are obtained, the speaker emphasized, by drawing the steel at 1015 degrees Fahr.

In discussing this paper one speaker pointed out that the success of this type machine lies in the skill of the operator. Another speaker was of the opinion that small billets are best conditioned by air hammers and large billets by machine.

Describes Water-Cooled Motors

Water-cooled motors may be found useful in connection with special processes in the steel mills. This fact was brought out by A. M. MacCutcheon, engineering vice president, Reliance Electric & Engineering Co., Cleveland, who in conjunction with W. R. Hough, electrical engineer of the Reliance company, spoke on "Special Electrical Drives for Steel Cleaning and Processing." Several motors of this type have been developed which give unusual results in providing a motor small in size and yet cool in operation, the speaker emphasized. Such a type of motor is particularly advantageous where the surrounding atmosphere is of high-temperature. The most remarkable fact about a water-cooled motor, the speaker contended, is the small amount of water necessary to remove the heat resulting from the losses within the motor, and the consequent small cost of the water involved. Stators are so designed that if a release valve is opened all water will drain from the inside of the motor exactly as water is drained from the cooling chambers of an automobile engine.

The speaker suggested liberal size motors for operating wheel grinders because of the load the operator frequently puts on the power unit. In speaking of motors for operating drop hammers, Mr. MacCutcheon mentioned that steel feet now are welded to the motor frame and that all pole connectors are oxygen free copper which stands up well against vibration.

In speaking on "Electrical Characteristics of Main Drive Motors at Inland Steel Co." R. W. Davis, electrical engineer, Allis-Chalmers Mfg. Co., Milwaukee, at the opening session of the electrical and mechanical divisions, Wednesday morning, mentioned that to change the 6-stand finishing mill from one specification to another required only a period of 36 minutes. The speaker described and discussed speed regulating equipment on this particular mill at length. One electrical engineer in discussing this paper was of the opinion that if mill operators would forget speed regulating instruments and pay more attention to the ampere meter, they would be better off. He was of the opinion, however, that a speed indicator as well as an ampere meter should be provided as standard equipment.

In discussing individual motor drives for the finishing end of a 72-inch hot strip mill, F. E. Harrell, assistant chief engineer and C. V. Gregory, engineer, Reliance Electric & Engineering Co., Cleveland, pointed out that the final determining factor in the selection of motor equipment might possibly be the speed range, the mill power supply, operating conditions, time of acceleration and decelerations of operations. The authors described at length the use of dynamic breaking through direct current as applied to the individual motors on run-out tables and coilers. Such breaking, the authors contended, permits of adjustment in stopping time over a wide range, stopping in shorter times, with far less loss and with smaller motors than alternating current plugging would make possible.

Good Lubrication Brings Lower Costs, Higher Operating Efficiencies

LUBRICATION as a factor of vital importance to the steel industry, and in fact all industry, was considered at a meeting of the lubrication division of the Association of Iron and Steel Electrical Engineers Wednesday morning, Sept. 19. Four papers on lubrication subjects, bulwarked by active discussion from the floor, made up the program for this meeting.

In introducing the subject, the chairman of the meeting, C. C. Pecu, lubrication engineer, Bethlehem Steel Co., Lackawanna, N. Y., declared that mechanical lubrication provides an effective stop for excessive wear and that while its adoption shows up best on old equipment, executives are coming to demand its installation on new equipment as well. He further pointed to a need for standardization of various lubricants in mill use today.

Reviews Lubricating Progress

Progress of centralized lubrication in the steel industry was reviewed by A. J. Jennings, Farval Corp., Cleveland, who pointed out that no industry offers a greater opportunity for lower costs and higher operating efficiency by means of improved lubrication than does the steel industry. Good lubrication not only demands the use of the correct grade of lubricant, but also requires that this lubricant be properly applied by a dependable method and at regular intervals. Use of a modern centralized system of lubrication combined with the correct grade of lubricant offers a number of important advantages, including no waste of lubricants, reduction of friction, lower power consumption, increased life of bearings, fewer repairs, increased production and complete safety.

Mr. Jennings outlined results obtained with a number of centralized lubricating systems on practically all types of rolling mill equipment, as well as on cranes, coilers, shears, punches, straighteners, levelers, blast furnace tops and other devices. Figures were presented to show savings in power consumption ranging from 5 to 30 per cent, with savings in bearing life ranging from 400 to 1000 per cent.

Leading devices offered for centralized lubrication service were described, as well as where the equipment is being used, what has been accomplished by its use and where suitable equipment for this purpose may be purchased.

Surveys Circulating Systems

Factors affecting the circulation of oil were touched upon by Maurice Reswick, lubrication engineer, Standard Oil Co. of New Jersey, New York, who declared that the closest approach to perfect lubrication is obtained in forced-feed systems which supply the wearing surfaces of bearings and gears with cool and clean oil from a central reservoir of ample capacity. Any circulating oiling system consists essentially of two complementary systems—the pressure system from the discharge end of the pumps to the point of delivery of the oil at the bearings or mesh line of the gears; and the oil return or gravity system, embracing all pipe lines or drains from the machine lubricated to the return tank.

Surveying the operation and maintenance of circulating oiling systems, Mr. Reswick discussed such factors as reconditioning of oil, design features of the oil systems, pressure lead lines, gravity return lines, and properties of mineral oils, extreme pressure lubricants, high viscosity index oils and various aspects of oil flow.

Work of the petroleum technologist and lubricating engineer in improving the manufacture and refin-

ing of various grades of lubricants was covered in a paper by G. W. Miller, president, American Lubricants Inc., Buffalo. With advances in mechanical design has come the need for lubricants that will stand greater heat and pressures, freedom from corrosion and sludging. This goal first was sought by vacuum distillation of crude oil; later developments have been the hydrogenation of crude; the mercury method in which crude is refined under a vacuum system heated by mercury boilers; and the solvent method of refining in which the refiner can sort out the type of hydrocarbon in the crude to obtain the best results in the finished product.

Hand in hand with refining developments has been the improvement in body or "oiliness" of lubricants. It has become possible to manufacture from crude oils themselves bodies which have the properties of those contained in the natural crudes, finally to add these bodies to the oils so that the oiliness lent to mixtures with petroleum oils is much beyond that which can be produced by any type of refining. With these natural crude oil bodies, friction under full fluid film lubrication can be reduced as much as 50 per cent. Similar results have been obtained by adding fatty oils such as oleic acid to mineral oils.

Improve Cold Weather Oils

Another interesting development cited by Mr. Miller concerned cold weather lubrication. Of the two types of mineral oils—paraffin and asphaltic—the former, although not freely flowing, has been found to have less internal friction at low temperatures. Now petroleum technologists have perfected paraffin oils which flow freely at temperatures as low as -30 and -40 degrees Fahr. This is made possible by the addition of paraflow, a specially processed mineral oil, to the paraffin oil.

Servicing of steam turbine, diesel and transformer oils was discussed by R. P. Dunmire, vice president, Buckeye Laboratories Inc., Alliance, O. According to Mr. Dunmire, study of various electrical insulating oils has shown that their deterioration is caused by contamination which consists of free water, solids and various types of sludges which are mostly soluble in mineral hydrocarbons. Sludges are caused by the presence of oxygen in the oil, and are of three principal types—the soap, asphaltic and carbon types.

Tests have proved that hydrocarbon mineral oils which have been degasified and dehydrated thoroughly have extraordinary values and resist oxidation to a marked degree, this being especially true when such oils, after being thoroughly degasified, are maintained in sealed systems under positive pressure.

Treatment for reclaiming and reconditioning oils includes removing all light volatiles by means of a low-temperature vacuum treatment, and then removing the polymerized compounds, resins, tars, waxes and acids by a simple adsorption process which consists of intimately contacting the oil with Fuller's earth for a definite time and at a definite temperature, and then thoroughly filtering out the earth with its adsorbed impurities. This operation, of course, removes the soluble contaminants as well.

It appears fundamentally true, Mr. Dunmire stated, that the economical reclamation of a lubricating or insulating oil depends largely on the quality of the original oil, as well as the refining process and equipment. The better the grade of oil initially, the greater the percentage of recovery with a corresponding decrease in costs of recovery and total lubricating costs can be expected.

To Sponsor Welding Clinic, Exposition in Cleveland

A three-day welding clinic and exposition, to be held in Cleveland, Chester avenue and East Thirtieth street, Sept. 27-29, has been announced by Hugh H. Dyar, manager of the Cleveland district of the Linde Air Products Co., New York. Sponsored by the Linde company and offered without charge or obligation, the clinic is designed to bring users of welding and cutting equipment up to date on latest developments and procedures, and to give operators, engineers, students, shop owners and others interested an opportunity to discuss their problems and experiences.

Starting at 8 a. m. each morning and continuing until 5:30 p. m., the clinic will include demonstrations, instruction, informal discussion, motion pictures and exhibits of pertinent equipment. Additional information may be obtained from the Linde headquarters in Cleveland, 628 B. F. Keith building.

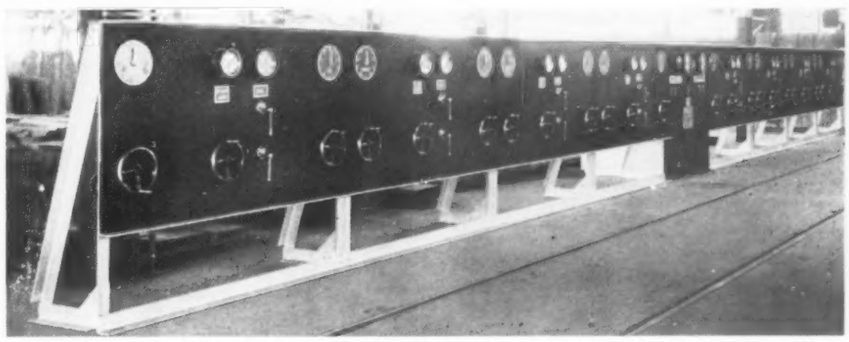
Heated Bearings-Lubricated By Colloidal Graphite

An interesting problem in lubrication at high temperatures has been solved by the Sperry Gyroscope Co., Brooklyn, N. Y. This involves the lubrication of bearings on high intensity carbon searchlights, which develop great heat in their operation. The difficulty was eliminated by the use of Aquadag colloidal graphite, manufactured for high-temperature lubrication by the Acheson Colloids Corp., Port Huron, Mich. By first operating the carbons, the mechanism operating the carbons is heated. Then a solution consisting of 50 parts of distilled water to 1 part Aquadag is squirted on the bearings just as though it were oil. The film thus formed is stated to give far better lubrication than any method previously tried.

Research Institute Booklet Describes Facilities

A pictorial outline of the service and facilities which Battelle Memorial institute, 505 King avenue, Columbus, O., offers for industrial research problems is presented in a recently published 16-page booklet, copies of which may be obtained by addressing Clyde E. Williams, director of the institute.

Illustrations depict the many types of equipment available at the institute for research and testing. Details of arranging and meeting the cost of a research program are explained. This is the second such booklet issued by the institute, the first being published in 1930, shortly after the undertaking was founded (see STEEL, Dec. 11, 1930, p. 58).



SOAKING PIT COMBUSTION CONTROL BOARD IS 75 FEET LONG: To be installed in the plant of a large steel company, this board serves two four-hole one-way fired soaking pits. Each panel of the unit is provided with suitable equipment for separating and independently controlling the combustion of its particular hole or pit. In the center of the control board is a master panel provided with equipment for indicating and controlling operation of each of the two blocks of pits. Installation is being made by the Surface Combustion Corp., Toledo, O., the photograph being taken in the plant of this company before shipment to the purchaser.

General view of the annual iron and steel exposition of the Association of Iron and Steel Electrical Engineers in Cleveland's public auditorium last week

Iron and Steel Exposition Points Way to Progress

WITH approximately 5000 in attendance during three days, the annual iron and steel exposition of the Association of Iron and Steel Electrical Engineers at Public auditorium in Cleveland, Sept. 18-20, was pronounced by both the 90-odd exhibitors and the crowds present a fine example of the confidence of manufacturers of capital goods for the steel industry in future progress of their profession, despite the fact that sales of this type of equipment are currently in disappointing volume.

New developments were many, and the tendency toward more effective use of light and color by exhibitors to catch the visitor's eye was noteworthy. A novel feature was a "one-way traffic" movement through the show, by means of which visitors were led past every booth before reaching the exit.

Electrical Devices Numerous

Secondary electrical equipment used at steel plants was displayed at many booths. General Electric Co., Schenectady, N. Y., showed an automatic welding head, welding electrodes and a welding transformer and in addition demonstrated a welding operation. Other equipment displayed at this booth included starters, a disk-type brake, an 800-pound thrustor, a foot-operated master switch for blooming mills, an alternating-current contactor, lead covered immersion heaters, timing controls for spot welders and textolite mill bearings.

A rotating cam limit switch for the new Ford continuous sheet mill was exhibited by the Electric Controller & Mfg. Co., Cleveland. This company also showed a master switch, an altitude regulator, a motor starter, a time current controller and safety switches.

Short circuiting a 5000-ampere no-fuse circuit breaker was demonstrated at the booth of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This company also displayed micarta rolling mill bearings, line starters and arc welding equipment for fabricating and repairing mill machinery, equipment and heavy plate work.

A working model of an automatic sheet measuring device featured the display of the Clark Controller Co., Cleveland. Other electrical equipment shown at this booth included an automatic transfer switch, primary resistor-type synchronous motor controller, a high-speed welding contactor, a mercury timing relay, across-the-line starter and a magnetic trolley controller.

A new small brake for quick, sure stops, alternating and direct-current solenoid operated, formed the center of the attraction at the booth of Cutler-Hammer Inc., Milwaukee.

Reliance Electric & Engineering Co., Cleveland, demonstrated a model of a roller motor, dynamic breaking generator, 50-horsepower direct-current fan-cooled motor and a 50-horsepower alternating-current stator.

A 55-inch magnet built with an arc control was shown a the booth of the Ohio Electric Mfg. Co., Cleveland. This magnet, which recently was introduced to the trade, contains about 25 per cent more copper than former types built by the company.

Flexible couplings built with rubber balls featured the display of Crocker-Wheeler Electric Mfg. Co., Ampere, N. J. The company also displayed a motor reducer of the vertical type for agitator drives.

Electrical equipment also was displayed by C. M. Kemp Mfg. Co., Baltimore, and the Wagner Electric Corp., St. Louis.

New Mill Bearings Shown

A wide assortment of antifriction bearings was displayed by six manufacturers. On display at the booth of the Timken Roller Bearing Co., Canton, O., were many bearings to be used on the new Ford wide sheet mill, including those for hot mill work rolls, cold mill drive, vertical edger and 2-high screwdowns.

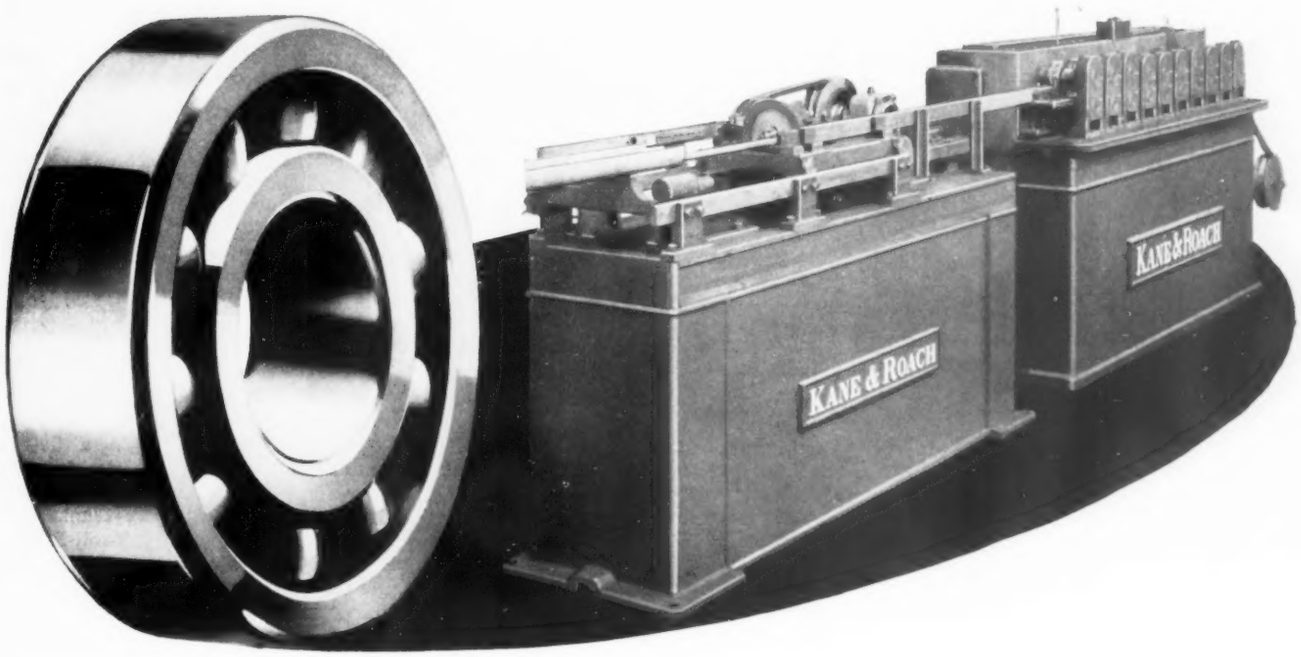
Two antifriction bearings taken from an 18-inch 2-high sheet bar mill in Japan, which had rolled 425,000 tons of steel and had been in service 13,000 hours, were displayed at the booth of S. K. F. Industries Inc., Philadelphia.

Roller bearings of various sizes were available for inspection at the booth of the Hyatt Roller Bearing Co., Harrison, N. J., which also had a photographic display of mill and crane-type motors, car journals, mill tables, ladles, scale cars, charging machines and the like, showing the application of roller bearings. In addition to double-row rolling mill bearings of metric and inch type shown at the booth of Norma-Hoffman Bearings Corp., Stamford, Conn., the company also had on display self-

Fabrication of Tubing..

AT 300 FT. PER MINUTE

promoted by 81 *FAFNIRS*



Copper or brass lock seam radiator tubing is the product of this new Kane & Roach Cold-Roll Forming Machine and Flying Saw. 5 H. P. do the trick with the aid of the Fafnir Ball Bearings and enable strips to be formed into tubing, tinned and cut at the extremely high rate of 200 to 300 feet per minute.

Saving power and increasing speed in the forming machine involved the use of 18 matched pairs of Fafnir Single Row and Fafnir Grease-Shield Bearings in the front of the main frame and 22 of the same size in the rear; the outboard housings are likewise so equipped. The flying saw incorporates Fafnir Flange Cartridges, special Precision Types and Double Row Grease-Shield Ball Bearings.

All this helps but to demonstrate again that Fafnir has the ideal bearing for every application. Kane & Roach Inc., are also in accord with the hundreds of users whose experience has proven conclusively that Fafnirs can be depended upon to carry the loads with practically no attention other than periodic lubrication . . . THE FAFNIR BEARING COMPANY, *New Britain, Conn.* Atlanta . . . Chicago . . . Cleveland . . . Dallas . . . Detroit . . . Milwaukee . . . Minneapolis . . . New York . . . Philadelphia.

Interesting installations which are producing profits for the users are described in Fafnir's House Organ, "The Dragon". We will gladly include your name on the mailing list. Just drop us a line.

FAFNIR BALL BEARINGS

aligning pillow blocks with roller bearings built with outer swivel.

Bearings also were displayed at the booths of Rollway Bearing Co. Inc., Syracuse, N. Y., and the Bantam Ball Bearing Co., South Bend, Ind.

Moving pictures of wide continuous strip mills producing a finished product of 64 inches wide were shown at the booth of the United Engineering & Foundry Co., Pittsburgh. Celluloid models of welded construction arranged in compartments with subdued lighting at the booth of the Lukens Steel Co., Lukenweld division, Coatesville, Pa., included a rolling mill housing, a crane girder, a diesel engine, a railway car truck frame and a built-up gear blank made of Cromansil steel.

Working models of a soaking pit crane, an open-hearth charging machine, a 200-ton type ingot stripper, a 15-ton worm driven magnet handling crane, and a 175-ton ladle crane were demonstrated at the booth of the Morgan Engineering Co., Alliance, O.

New Soaking Pit Design

A model of a duplex soaking pit fired through the center with a flame of the umbrella type was shown by Amsler-Morton Co., Pittsburgh. Claim is made that the unit will save 30 per cent in fuel and 20 per cent of the initial investment.

A 2-high sheet mill, rolls, and couplers were displayed by Continental Roll & Steel Foundry Co., East Chicago, Ind., which also displayed blue prints of mill designs.

Cleveland Crane & Engineering Co., Wickliffe, O., operated a model of a welded rolled steel trolley with built-in scale and also showed a model of a welded steel oil-type gear case.

At the booth of the Chicago Rawhide Mfg. Co., Chicago, its various products were available for inspection including rawhide, hydraulic packing, oil seals, belting, hammers, mallets and mauls, belt lacing, rawhide belt pins and mechanical leathers.

Fast's type self-aligning couplings in various types including the standard, mill motor, cutout, Jordan, shear pin and heavy-duty dustproof rolling mill types were shown at the booth of Bartlett-Hayward Co., Baltimore.

Working models displayed by the Alliance Machine Co., Alliance, O., included a low-type open-hearth charger with a worm drive and a one-piece trolley, a car dumper, an ingot stripper, a forging manipulator, and a ladle crane trolley and rope reeving unit. Featuring this display was a model of the company's latest machine namely, a combined stripping and extracting frame with auxiliary stripping rig for stripping small end up and big end up ingots with and without hot tops.

Various alloy gears, a connecting rod and pinch roll with brinell numbers stamped thereon were shown at the booth of the National-Erie Corp., Erie, Pa.

Metered ratio control of gas and air and the stabilized control system were demonstrated with commercial units at the booth of H. A. Brassert & Co., Chicago. Multi-panel automatic air filters for continuous or heavy duty service and for ventilation for intermittent service were shown by the American Air Filter Co. Inc., Louisville, Ky. Other companies displaying steel plant equipment included Erie Construction Co., Erie, Pa., Ajax Flexible Coupling Co., Westfield, N. Y., and the Tool Steel Gear & Pinion Co., Cincinnati, O.

Forming the center of attraction at the booth of the Farval Co., Cleveland, was the company's system of lubrication mounted on a display board. Illuminated photographs depicted the company's installation on 4-high strip mills, shears, presses, pipe mills, bar mills, cranes and universal plate mills. Samples of oils for antifriction bearings, ring oiling bearings and roll neck bearings of the metallic, wood, and composition types were on display at the booth of the Keystone Lubricating Co., Philadelphia. The Standard Oil Co. of Ohio, Cleveland, also displayed various samples of oils on a miniature stage as well as an automobile engine inverted to demonstrate the action of heavy and light lubrication. The Adams-Schuette system of lubrication demonstrating the disadvantage of line friction encountered in $\frac{1}{2}$-inch and $\frac{3}{4}$-inch fuel pipe lines, was shown at the booth of Hodson Corp., Chicago.

Trucks in the Spotlight

Industrial trucks seem to be meetcupied an important position among the exhibits. The booth of the Yale & Towne Mfg. Co., Philadelphia, was given over to a display of several types of chain hoists and two models of battery-powered industrial trucks. One was a platform type; the other a lift truck powered by a nickel-iron-alkaline storage battery.

Industrial trucks seem to be meeting with increasing favor from plant operators who see in them more economical and more flexible means for moving materials than offered by cranes. While capacities do not compare with the average crane, they are being increased. As an example the Automatic Transportation Co., Chicago recently built a truck for handling 31-ton automobile dies, and has been requested to design a 50-ton model. At the exposition this company showed in operation a telescoping high-lift and tilting truck with 103-inch full height. Elwell-Parker Electric Co., Cleveland, showed a gas-electric 6000-pound fork truck of the tilting and tiering type, equipped with a special spindle for handling coils of strip steel.

Streamlining has invaded even the industrial truck field, Baker-Raulang Co., Cleveland, exhibiting a 3-ton elevating platform truck with operating mechanism completly shielded and streamlined, and of all-welded construction. This company also displayed a 3-ton high-lift electric truck.

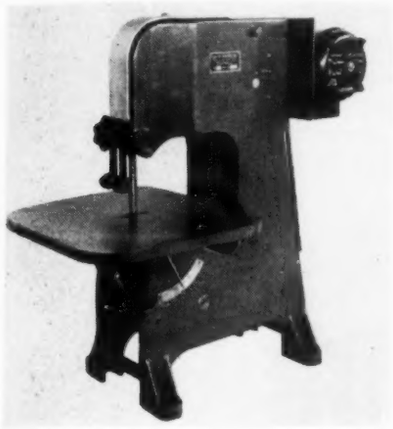
Battery units for powering these trucks were exhibited by Electric Storage Battery Co., Philadelphia, the display including various size cells embodying the company's ironclad principle of construction as well as the new microporous rubber separators, the latter claimed to increase cell life appreciably. Heavy-duty stand-by batteries for steel mill and other industrial uses, also were shown. The recently developed nickel-iron-alkaline storage battery for industrial use was featured in the exhibit of the Edison Storage Battery Co., Orange, N. J.

Control devices were displayed prominently in an attractive booth by the Minneapolis-Honeywell Regulator Co., Minneapolis. Among a wide range of control devices were automatic processing controls, a propor-

(Please turn to Page 66)

Looking down the first aisle at the show. One-way traffic routing insured visitors passing all exhibits before leaving

Filing Machine—Grob Bros., South Ninety-seventh street and West National avenue, West Allis, Wis., is placing on the market a bench type, model B-3 filing machine, shown



Model B-3 *bench type filing machine developed by Grob Bros.*

herewith. Like the previous models this machine cuts continuously by means of an endless file-chain which has made the filing of dies, punches, templates and miscellaneous parts a high production operation. The machine has a three-speed V-belt drive and a positive drive to the file-chain. Proper tension on the file-chain is always assured as the upper sheave is fastened to a hinged bracket which is held in position by a long extension spring.

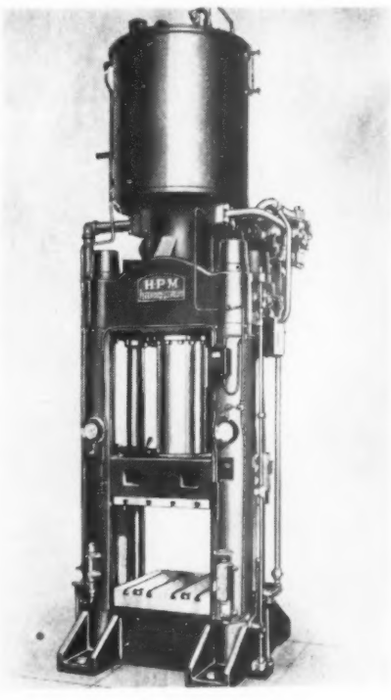
An improved feature is the arrangement for the quick release of the tension on the file-chain. A single movement of a lever on the upper left side of the machine connected with a cam moves the idler sheave downward. With this provision the time required to set up for internal filing and to change file-chains is reduced to half a minute. The file-chain is of simple self-locking design and carries 19 files, each 3 inches long. The files, accurate in size and the ends cut off at an angle, are guided firmly by a full support back rest and thereby provide such smooth cutting action that the passing from one file to the next cannot be felt by the operator.

Material up to 4 inches in thickness can be filed and the file-chain can be inserted into openings as small as ⅜ inches in diameter. All sheaves and pulleys are mounted on sealed ball bearings. The tiltable table 15 x 17 inches in size is 14 inches above the bench and the total height of the machine is 29 inches. The machine is equipped with a ¼ horsepower motor and weights 175 pounds.

◆ ◆ ◆

Long Stroke Drawing Press—Hydraulic Press Mfg. Co., Mt. Gilead, O., recently developed a long stroke press to meet the requirements of deep drawing operations. The unit, shown herewith, is equipped with a synchronized pressure die cushion. This cushion added to the hydro-power press particularly fits it for performing deeper draws in single press operations. This cushion is actuated by a series of hydraulic cylinders which are hydraulically connected with the same source of pressure that operates the press itself. Thus the action of the die cushion is synchronized automatically with press movements and pressure, the blank-holding pressure being automatically proportioned to the drawing pressure. These features are covered by patents.

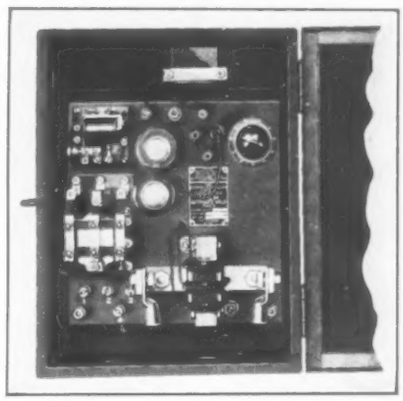
The hydro-power "Fastraverse" press including the die cushion is completely self-contained with direct-motor drive through the H-P-M hydro-power unit, mounted on the presshead, and fitted with a complete system of patented controls for both press and die cushion. The operator's press controls, including gage, are conveniently grouped on the right-hand press column, while the die cushion pressure regulator and gage are located at the left. The hydro-power die cushion is an exclusive development of the company to be used in connection with its complete line of modern H-P-M hydro-power presses for metalworking service.



H-P-M long stroke press meets deep drawing requirements

◆ ◆ ◆

Automatic Weld Timer—Electric Controller & Mfg. Co., 2700 East Seventy-ninth street, Cleveland, is announcing a new electric weld timer for use with resistance welding machines. Although operating on the same principle as the Folio 1 weld timer, namely that of taking into consideration the many variables entering into the welding circuit and timing the weld with respect to the current flow, this newly designed Folio 2 timer, shown herewith, is an improvement over its predecessor. It contains less apparatus, the dust-tight enclosing cabinet is smaller and not as deep, and the operation of the timer is twice as fast as the previous one.



EC&M automatic weld timer for use with resistance welding machines

This faster operation not only makes it possible to produce many more welds per minute for a given material, but also greatly increases the number of different kinds and also the variety of thicknesses of metals which now may be satisfactorily welded under the control of this new device. In practice, for example, it has been demonstrated that when welding certain alloys and metals of high thermal conductivity, a high current with extremely short time must be used. Under these conditions the increased speed of operation of the Folio 2 timer will make it possible to use a higher heat

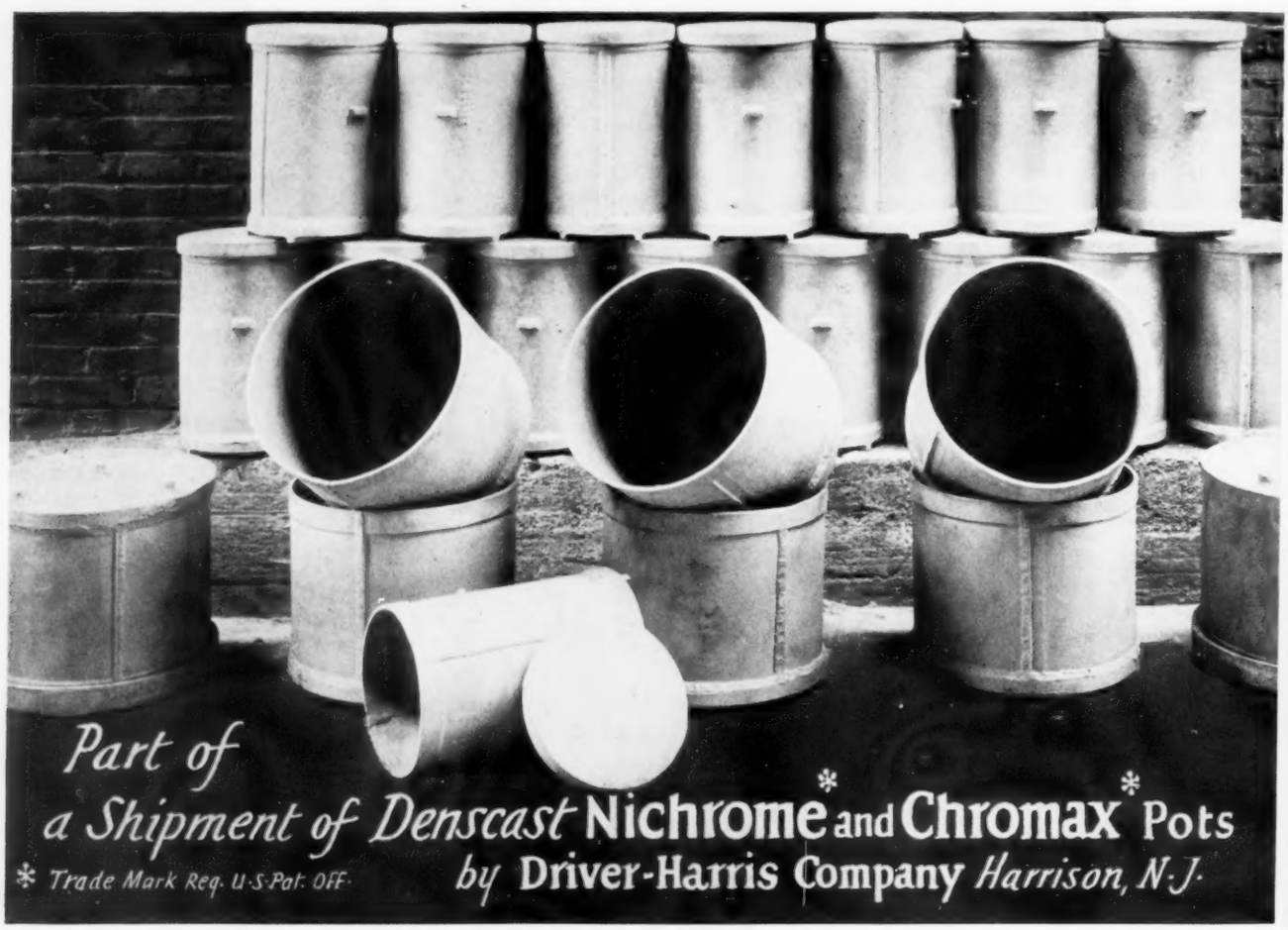
Glad to See You at Booth No. 126

At the Driver-Harris Booth you will find "Nichrome" Castings for heat-resisting purposes in the form of Carburizing Containers, lead, cyanide and salt pots, retorts, tubes, furnace parts, dipping baskets, pyrometer tubes, enameling racks, chains; "Chromax" Castings for heat-resisting purposes at moderate temperatures; "Nichrome" Denscast and Sheet Carburizing Containers and "Nichrome" Valves for Diesel Engines, etc.

Our engineers will be glad to cooperate in solving your heat-resisting problems.

Nichrome

TRADE MARK REG. U. S. PAT. OFF.



– proved by performance

tap on the welding machine thus providing greater concentration of the heat at the point where the weld is desired, and at the same time closer control of the number of heat units put into each weld, can be secured.

In addition to an adjusting dial for varying the time, the new unit also is equipped with a means to provide a triple current range for a timer of given capacity. The change from one range to another is obtained quickly by inserting a plug into one of three receptacles located on the front of the panel. By this means a much more refined control of the length of time the current is on, is possible. These two adjustable features should not be confused with the automatic time varying characteristics of the EC&M weld timer; they merely allow selection of the best operating conditions for the work at hand and heat tap used, and when so adjusted, the timer does not provide a definite amount of time for each weld, but varies the time in inverse proportions to the rate of current flow so as to produce perfect welds of uniform consistency.

♦ ♦ ♦

Drill Grinder—William Sellers & Co. Inc., 1600 Hamilton street, Philadelphia, recently introduced a new No. 05D drill grinder, shown herewith. This bench type unit has a built-in motor, push button control and is designed to handle drills from $\frac{1}{16}$ to $\frac{1}{2}$ inch in diameter.

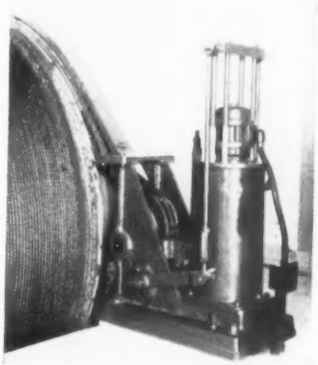
In design the chuck embodies two slide rests, one parallel to the axis of the grinding wheel and the other at right angle. These slides are of the protected dovetail type with adjustable shoes. Movement of the chuck toward the face of the wheel is controlled by a micrometer handwheel adjustment, whereas movement to carry the drill point across the face of the abrasive wheel is accomplished by a lever.

The drill must necessarily be held rigidly. To effect this, hardened steel jaws grip on the edges of the flutes as close as possible to the cutting lips. An adjustable back center supports the shank of the drill. A quarter turn of the clamping knob actuating the upper and lower jaws simultaneously by means of a cam movement, holds the drill securely without further hand pressure.

To co-ordinate efficiency, appearance and economy in the design of the machine, the engineers recruited the possibilities of new materials and parts now available. Chromium plating was adopted to overcome wear where abrasive dust from the grinding is apt to work into the moving parts of the clamping mechanism.

♦ ♦ ♦

Thrustor—General Electric Co., Schenectady, N. Y., recently announced a number of improvements in its thrustor, a self-contained combination of motor-driven centrifugal pump, oil chamber, and piston that produces a smooth straight-line thrust through a definite length of stroke especially suitable for the operation of clutches, brakes, valves, doors, etc. The new line consists of a complete range of standard models providing 10 combinations of thrust and stroke ratings varying from 50 to 3200 pounds thrust and from 2 to 16 inches stroke.



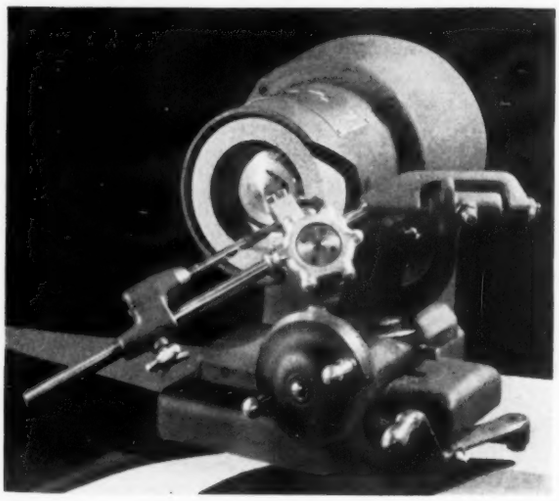
General Electric thrustor has variety of applications

Cleco line strainer developed by Cleveland Pneumatic Tool Co. to prevent scale and trash from entering air tools

In the new unit, shown at left, the impeller housing of the centrifugal pump is stationary, a rigid shaft running in ball bearings connecting the impeller to the driving motor. A number of driving motor arrangements are available—alternating current or direct current. All motors are totally enclosed (except direct current and single-phase motors on the 50-pound size) for protection against dirt and moisture.

♦ ♦ ♦

Air Strainer—Cleveland Pneumatic Tool Co., 3734 East Seventy-eight street, Cleveland, recently announced a new line strainer designed to be placed at individual air outlets to trap scale, grit, and trash out of the lines to prevent the clogging of air screens and the entry of debris into the working parts of pneumatic tools. Even where separators are used, the application of these individual air strainers has been found to be highly beneficial, since much scale and dirt has its origin between the separator and the outlet end of the pipe line. The line strainer, depicted above, catches this harmful dirt at the point where it would enter the hose attached to the tool. The device is made in three sizes, $\frac{1}{2}$, $\frac{3}{4}$ and 1-inch.



THIS bench type drill grinder was designed by William Sellers & Co. Inc. to furnish users of small drills with a machine that will not only sharpen dulled drills accurately and rapidly but also will reclaim broken drills

Low-Alloy High-Tensile Steels Meet Demands for Lightness and Strength

(*Concluded from Page 44*)

per. Sil-Ten is regular "silicon" structural steel to which this copyrighted name has been given.

The corrosion resistance of these steels in the atmosphere is pointed to as high, particularly Cor-Ten. Taking ordinary open-hearth as unity or one, the Cor-Ten steel is claimed to have 4 to 6 times the atmospheric corrosion resistance. Man-Ten with copper and Sil-Ten with copper are rated at 2 to 3 times that of ordinary steel.

As to weldability, these steels are claimed to be capable of satisfactory welding by any of the usual methods. Suitable coated rods are available for electric welding which will give beads of approximately the same analysis as the base metals and with a corrosion resistance comparable to that of the base metals. Riveting problems are said to be absent.

The high impact values of Cor-Ten and Man-Ten are pointed to as features, particularly those of the former. Tests already made show these values to be high also at low temperatures—below zero.

Another quality of these steels is their capability of both cold and hot forming. The extent of the cold forming operations depends on the ductility. In all forming or pressing, it is stated, slightly greater strengths are developed but the hardening is not excessive.

Some railroads already have purchased Cor-Ten for use in freight car construction. It is pointed out that without radical changes in design the use of this steel indicates a minimum conversion of dead weight into live load capacity in a 50-ton open-top freight car, adding about 8 per cent to the revenue.

These steels are capable of heat treatment but the results given in the table refer to the as-rolled condition. Heat treatment gives higher strengths. The various grades may be obtained in the soft annealed, or in the hard nonductile condition as-rolled.

Other Steels

The foregoing facts present the situation substantially as it exists today in the United States. Doubtless in other steelmaking countries, there are similar steels, but probably there are not so many.

As to Germany, some interesting facts were published in one of the German papers. H. Kappenberg in *Zeitschrift des Vereines deutsches Ingenieure* has presented a list of the leading German low-alloy high-strength steels; it is given in table VII.

In this table the standard cupriferous steel is known as steel 52. It is largely a Freund or high-silicon steel containing copper. The Lauchhammer structural and the Krupp steels are medium-manganese steels with copper. The Krupp steel is similar to the American "Man-Ten." None of the American steels reviewed in this article parallels the German Union steel—unless it be possibly "Cor-Ten." Of course, G. H. H. may be classed as a medium-manganese steel containing copper and molybdenum but relatively high in silicon which is characteristic of most of these German steels.

It is evident that the possible combination of elements for the purpose of making a low-alloy high-tensile steel is broad. It is resulting in this country in the offering of too many steels when two or three or even less would meet all ordinary requirements.

Iron and Steel Exposition

(*Concluded from Page 62*)

tioning system of automatic control and air conditioning and refrigeration control equipment. Leeds & Northrup Co., Philadelphia, also displayed control equipment, arranging its booth to illustrate a system of open-hearth furnace control, making use of the company's various meters with lights and illustrations to complete the picture.

Open-hearth control meters for regulating temperatures of roofs, checkers and fuel, as well as fuel flow, were shown by the Brown Instrument Co., Philadelphia. Bailey Meter Co., Cleveland, displayed a galvatron-type pyrometer, furnace draft control and a fuel flow-air flow ratio meter for combustion control and recording.

Weston Electrical Instrument Co., Newark, N. J., showed a complete assortment of the various types of meters which it manufactures, including the new sightmeter for quick measurement of illumination levels directly in foot-candles.

In addition to various types of large and small control valves, the Homestead Valve Co., Coraopolis, Pa., featured a high-pressure jenny or vapor spray cleaning machine for cleaning plant floors and equipment (STEEL, Aug. 13, p. 48).

Fuse boxes and magnetic switches were displayed by Colt's Patent Fire Arms Mfg. Co., Hartford, Conn. Cast iron boxes designed to resist attack of corrosive atmospheres were included in this exhibit. Lighting panels employing thermal circuit breakers were exhibited by the I-T-E Circuit Breaker Co., Philadelphia. A feature of the latter booth was a large 4000-ampere three-pole solenoid operated air circuit breaker of the truck type for steel mill applications. Motor starting switches and other types of industrial switches were shown by Trumbull Electric Mfg. Co., Plainville, Conn.

Brushes and various equipment for reclaiming and rebuilding worn commutators were inspected in the booth of the Ideal Commutator Dresser Co., Sycamore, Ill.

An attractive exhibit was arranged by the National Carbon Co., Cleveland, to show carbon brushes, welding carbons and its Gredag graphite-base lubricant. Carbon brushes of all types and sizes were displayed by the Superior Carbon Products Inc., Cleveland, and the Morganite Brush Co. Inc., Long Island City, N. Y.

Included in the display of the Benjamin Mfg. Co., Desplaines, Ill., were electrical accessories and several types of glass-steel diffusers for industrial lighting fixtures. A fairly complete range of lighting fixtures for plant use was demonstrated at the booth of the General Electric Supply Corp., Bridgeport, Conn.

"Portable electricity" was the theme of the exhibit of the Bull Dog Electric Products Co., Detroit, which showed some interesting devices for carrying electricity through shops without the use of wires. The system involves the use of buss-bars mounted in insulated sheet steel ducts.

Measurement of either alternating or direct current without attaching meters to power lines was demonstrated by the Martindale Electric Co., Cleveland. The device for doing this is known as a tong, placed around the line and translating the magnetic flux around the wire into amperes of current.

Force-feed lubricators for positive lubrication of equipment were demonstrated and explained at the exhibit of the United-American Bosch Corp., Springfield, Mass.

Insulating materials, covering the range of temperatures from 40 to 2500 degrees Fahr., were shown by Johns-Manville Sales Corp., New York.

A striking exhibit was presented by the Aluminum Co. of America, Pittsburgh, in which, by generous use of light and color, attention was drawn to two types of aluminum buss-bars, as well as other miscellaneous aluminum products.

The Electrical League of Cleveland sponsored a novel lighting exhibit in which some 18 manufacturers and organizations participated. Fixtures were installed and operated to show correct lighting intensities in industry, offices and the home. In this exhibit, Ajax Electrothermic Corp., Trenton, N. J., operated three small induction furnace models.

RPORATION, NEW YORK, N.Y.

WIRE AND STRIP ANALYZER

For Laboratory and Research

The most compact unit made. Ease of operation. Wide field of application in the control and manufacture of strip wire and small rounds. Interchangeable test coils.

For 110 volts 60 cycles. Dimensions: 30¾" x 14¼" x 12" Weight 65 lbs.

MAGNETIC ABNORMALITY DETECTOR

For the Open Hearth and Electric Furnace

A precision instrument. Fully automatic. Permits definite analysis of "normal" or "abnormal" steel either before release of furnace charge or by taking sample from ladle platform.

For 110 or 220 volts 25 or 60 cycles. Dimensions: 30" x 18" x 21" Weight: 250 lbs.

Request Engineering Estimates for Special Applications

Magnetic Heat-Treatment and Furnace Controls

110 WASHINGTON STREET — WHITEHALL 4-2984 — FERMANGO

NAL METAL EXPOSITION

INSPECTION INSTRUMENTS

Hotel Pennsylvania will be headquarters for the American Society for Metals and the Institute of Mining and Metallurgical Engineers

NEW YORK READY FOR FIRST METAL CONGRESS AND SHOW

AFTER having visited all of the major industrial centers of the East and Middle West one or more times during the past 15 years, the Sixteenth Annual National Metal congress and exposition goes to New York. The choice of this great metropolitan center for the 1934 meeting and show, Oct. 1-5, was made in response to the wide-spread and insistent demand given expression during the last few years.

Convention cities previously have been selected because of their importance in the basic production and processing of iron and steel and other metals. While it is true that New York embraces wide and substantial metalworking activities, it is regarded chiefly as the country's leading commercial city. Holding of the congress and exposition in that city therefore is significant. This departure from custom reflects the transfer of emphasis from production to distribution, or merchandising.

Events of the depression, bringing about low volume output, have forced this new viewpoint upon industry, but the inertia of long years of self-satisfaction has made it difficult to accept the need for change. Many large steel and metal producing units maintain headquarters or important offices in New York, thus it is appropriate that the city should receive the 1934 metal congress and exposition at the beginning of the new industrial era.

Chief sponsor and originator of the Annual National Metal congress and exposition is the American Society for Metals, until recently known as the American Society for Steel Treating. Co-operating in the congress as in past years are the American Welding society, the Ameri-

—*Brown Bros. photo*

The steel industry can well take pride in the array of skyscrapers which compose the appealing skyline of midtown New York. This view was taken looking south across Central park from Eighteenth street

CONTENTS

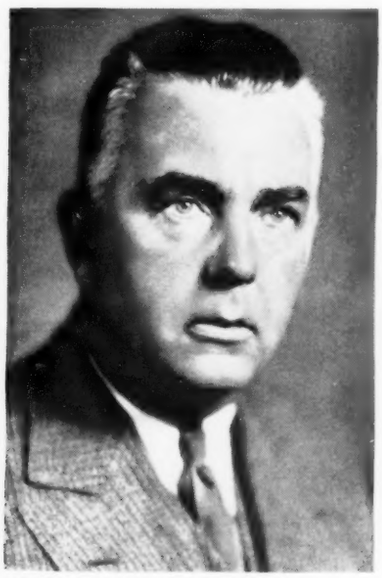
	Page
National Metal Congress and Exposition	74
Programs:	
American Society for Metals	82
American Welding Society	90
American Society of Mechanical Engineers	94
American Institute of Mining and Metallurgical Engineers	97
Wire Association	105
Exhibitors in National Metal Exposition	110

can Institute of Mining and Metallurgical Engineers, the Wire association and the American Society of Mechanical Engineers.

Hotel Pennsylvania will be A.S.M. headquarters. Morning sessions will be held here; afternoon meetings will be in the Port of Authority building. A total of 37 technical papers have been arranged for presentation at the ten sessions. The two sessions on Friday will be devoted to a symposium on grain size with 11 papers to be read.

The society will hold its annual business meeting on Wednesday morning, after which Dr. V. N. Krivobok, Carnegie Institute of Technology, will present the Campbell Memorial lecture.

The society is offering a 5-period educational course on "Selection, Properties and Uses of Commercial Tool Steels." James P. Gill, chief metallurgist, Vanadium-Alloys Steel Co., Latrobe, Pa., has arranged the course and will conduct it. The first four lectures will be held in the Port of Authority building at 4 p. m. each day from Monday through Thursday; the Friday lecture will be at 8:30 a.m. in Hotel Pennsylvania.



W. H. Phillips

President, American Society for Metals

Tom M. Girdler, chairman of the board, Republic Steel Corp., Cleveland, will speak at the banquet on Thursday evening. Following his address, several medal awards will be made, including the recently established Albert Sauveur Achievement medal to Dr. Sauveur, the Henry Marion Howe gold medal to the author of the best paper published in the society's *Transactions* during the past year, and the Past President's medal to W. B. Coleman. The banquet will be in the nature of a testimonial dinner to Dr. Sauveur.

Largest Show In Five Years

The first National Metal exposition to be held in New York will have the distinction of being the largest and finest since the great show of 1929 in Cleveland. Approximately 150 manufacturers have engaged space in the show which will be located in the mammoth Port of Authority building which has splendid exhibition facilities. All exhibits will be located on one floor. In amount of floor space to be occupied, the 1934 exposition will be nearly half again as large as the Detroit exhibition last year.

National officers of the American Society for Metals are: President, W. H. Phillips, vice president, Molybdenum Corp. of America, Pittsburgh; vice president and president-elect, B. F. Shepherd, manager, rock drill division, Ingersoll-Rand Co., Phillipsburg, N. J.; treasurer, Emil Gathmann, president, Gathmann Engineering Co., Baltimore; secretary, W. H. Eisenman, 7016 Euclid avenue, Cleveland.

Trustees of the society are: Past President W. B. Coleman, president, W. B. Coleman & Co., Philadelphia; R. S. Archer, chief metallurgist, Republic Steel Corp., Chicago; W. P. Woodside, vice president in charge of research, Climax Molybdenum Co., Detroit; H. G. Keshian, metallurgist, Chase Companies Inc., Waterbury, Conn.; and E. C. Bain, metallurgist, research laboratories, United States Steel Corp., Kearny, N. J.

—*New York Edison Co.*

A night view of the Statue of Liberty which stands on Ellis Island and serves as a beacon marking the entrance to the New York harbor

Society for Metals Dates Back to War Period

THE American Society for Metals, dates its origin back to 1914, when during the World war considerable attention was being given to the heat

(*Please turn to Page* 87)

W. H. Eisenman

Secretary, American Society for Metals. He is also Manager of the National Metal Exposition

Announcing

THIS improved G-E self-stabilized, self-excited welder establishes new standards of modern welding equipment. It is designed as a complete welding unit, incorporating all the desirable characteristics necessary for long, satisfactory, trouble-free operation.

IT WILL PRODUCE SUPERIOR WELDS . . . and therefore a better product with fewer rejects.
Its performance is as satisfactory with bare or lightly coated electrodes as with heavily coated electrodes. This is the result of adequate **self-stabilization**.

The generator has that stability of arc, together with the rapid voltage recovery known as "pep," which makes the arc respond instantly to changes in welding conditions, without sluggishness or "over-shooting."

IT SAVES TIME . . . superior welds can be made more quickly and more easily.
The polarity can be reversed instantly and positively by the simple movement of a handle on the control panel, which reverses the current in the welding leads.

The sets can be readily moved, either by slings from a crane or by means of a strong, three-wheel running gear. They are light in weight, and have adequate road clearance and low center of gravity—one wheel can pass over an obstruction 10 inches high without overturning the set.

IT SAVES MAINTENANCE EXPENSE . . . through minimum outlay for repairs with maximum use of equipment.
All auxiliary, power-consuming, external devices, such as reactors, resistors, and exciters, have been eliminated by the improved, exclusive, G-E design.

The set is designed to stand abuse and to give long, trouble-free service. Protection against weather and falling objects is provided by suitable covers. Lubrication is required but once a year.

IT IS POPULAR WITH THE WELDING OPERATOR . . . its improved performance gives increased confidence.
He can readily obtain the proper welding current at the most desirable open-circuit voltage by means of the independent control of voltage and current.

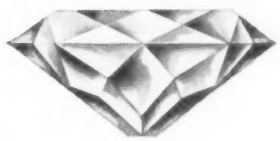
All handles, knobs, and buttons are large and are easily grasped, even with a gloved hand. The control panel is located at a convenient height. The panel is dead-front; there are no exposed connections.

You can obtain this improved G-E welder in a variety of types—motor-driven, gas-engine-driven, and belt-driven sets. Ask the nearest G-E welding distributor for complete information, or write to the nearest G-E Sales Office. General Electric Company, Schenectady, N. Y.

GE

GENERAL

for shaping and conditioning hard cemented carbide tools



IT'S MADE OF CRUSHED DIAMONDS!

CARBORUNDUM Research Laboratories announce a new wheel made from genuine, crushed South African Diamonds—a wheel that through long exhaustive tests has shown startling results in grinding hard cemented carbides.

On pure cemented carbides this new wheel is approximately thirteen times faster cutting—removes thirteen times more stock per minute than previous specially developed abrasive wheels.

In the grinding of mounted tips—that is grinding the cemented carbide as well as the steel tool stock—the new Diamond Wheel shows four times greater stock removal per minute.

The diamonds used are small South African gems too small and off-colored to be considered precious. They are crushed—accurately graded to comparatively coarse, 90 grit; the fine, 220 grit; and extra fine, 400 grit—and bonded with a special bond developed in our laboratories. The result is a wheel that cuts with astonishing speed.

The new Diamond Wheels require no dressing—in fact, it is impossible to dress them. The thousands of tiny diamonds that stand out like so many miniature cutting tools do not break down or crush. They stay permanently sharp precluding the need of dressing—even if it could be done.

These wheels are made to micrometer exactness—balanced to within a fraction of a gram. The new wheel is used with water—wet grinding—and it produces clean, true, straight, un-nicked edges and truly flat tool faces—beautifully finished. Overheating is eliminated—in grinding, the tools aren't even uncomfortably warm.

It is important to note, that by finishing with the fine grit wheel, the long, tedious, costly operation of lapping is eliminated.

Indications are that the Diamond Wheel can be effectively used also in many and various fields on materials approaching in hardness the cemented carbides. Studies of these applications are now being made.

Limited stocks are now available in six and seven inch diameter wheels in three grits.

Again Carborundum makes an important contribution to industry.

THE CARBORUNDUM COMPANY

REG. U. S. PAT. OFF.

Niagara Falls, N. Y.

Canadian Carborundum Co., Ltd., Niagara Falls, Ont. Sales Offices and Warehouses in New York, Chicago, Boston, Philadelphia, Cleveland, Detroit, Cincinnati, Pittsburgh, Milwaukee, Grand Rapids; Toronto, Ont. (Carborundum is a registered trade-mark of The Carborundum Co.)

Program of American Society for Metals

Monday, Oct. 1

10:00 A. M.—Hotel Pennsylvania Ballroom

Heat Treating Session

Physical Properties of Case Hardened Steels, by O. W. McMullan, Timken-Detroit Axle Co., Detroit.

Heat Treatment in Controlled Atmospheres Including Gaseous Carburizing, by C. R. Austin, Pittsburgh.

Influence of Nonmetallic Inclusions Upon the Precipitation of Primary Cementite in Hypereutectoid Steels, by E. G. Mahin and E. F. Lee, University of Notre Dame, Notre Dame, Ind.

2:00 P. M.—Port of Authority Building

Research Session

A Graphical Method for Calculating Heat Loss Through Furnace Walls, by C. E. Weinland, Johns-Manville Research Laboratories, Manville, N. J.

Properties of Some Cast Alloy Steels, by T. N. Armstrong, Norfolk Navy Yard, Norfolk, Va.

A Comparison of the Corrosion Resistance of Several Wrought Irons Made by Different Processes, by O. A. Knight and J. R. Benner, Pennsylvania State college, State College, Pa.

Practical Observations of Some High-Carbon, High-Chromium Tool Steels, by W. H. Wills, Ludlum Steel Co., Dunkirk, N. Y.

Tuesday, Oct. 2

10:00 A. M.—Hotel Pennsylvania Ballroom

X-Rays Session

Grain Distortion in Metals During Heat Treatment, by C. Nusbaum, Case School of Applied Science, Cleveland, and N. P. Goss, Cold Metal Process Co., Youngstown, O.

X-Ray Exposure Charts for Steel, by H. R. Isenburger, St. John X-Ray Service Inc., Long Island City, N. Y.

New Development In Electrical Strip Steels Characterized by Fine Grained Structure Approaching the Properties of a Single Crystal, by N. P. Goss, Cold Metal Process Co., Youngstown, O.

Cutting Temperatures Developed by Single-Point Turning Tools, by O. W. Boston and W. W. Gilbert, University of Michigan, Ann Arbor, Mich.

2:00 P. M.—Port of Authority Building

Aging Session

Prolonged Tempering at 100 Degrees Cent. and Aging at Room Temperature of 0.8 Per Cent Carbon Steel, by G. A. Ellinger and R. L. Sanford, National Bureau of Standards, Washington.

The Effect of High Hydrostatic Pressures on Aging, by L. R. Van Wert, lecturer on metallurgy, Harvard university, Cambridge, Mass.

Directional Properties in Rolled and Annealed Low-Carbon Steel, by Arthur Phillips and H. H. Dunkle, Yale university, New Haven, Conn.

Wednesday, Oct. 3

10:00 A. M.—Hotel Pennsylvania Ballroom

Annual Meeting of American Society for Metals.

Campbell Memorial Lecture, by Dr. V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh.

2:00 P. M.—Port of Authority Building

Research Session

Alloys of Iron and Manganese, Part XIII, by F. M. Walters Jr., and Cyril Wells, Carnegie Institute of Technology, Pittsburgh.

The Influence of Oxide Films on the Wear of Steels, by S. J. Rosenberg and Louis Jordan, National Bureau of Standards, Washington.

The Metastability of Cementite, by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

Magnetic Properties of Iron as Affected by Carbon, Oxygen and Grain Size, by T. D. Yensen, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. and N. A. Ziegler, West Penn Electric Co., Pittsburgh.

Thursday, Oct. 4

10:00 A. M.—Hotel Pennsylvania

Research Session

The Cobalt-Molybdenum System, by W. P. Sykes and Howard F. Graff, Cleveland Wire Works, General Electric Co., Cleveland.

Malleable Castings, by Albert Sauveur and H. L. Anthony, Harvard university, Cambridge, Mass.

Oxidation of a Low-Carbon Steel in the Temperature Range 1650 to 2100 Degrees Fahr., by C. A. Siebert, United States Rubber Co., and Clair Upthegrove, University of Michigan, Ann Arbor, Mich.

The Ductility of Chromium-Nickel Austenitic Steels at Elevated Temperatures, by H. D. Newell, Babcock & Wilcox Tube Co., Beaver Falls, Pa.

2:00 P. M.—Port of Authority Building

Steel Melting Session

Studies on the Metallurgy of Arc-Deposited Weld Metal, by S. L. Hoyt, A. O. Smith Corp., Milwaukee.

The Effect of Deoxidation on Some Properties of Steel, by C. H. Herty Jr., Bethlehem Steel Co., Bethlehem, Pa.

Nonmetallic Inclusions in Steel, by S. F. Urban, National Tube Co., Ellwood City, Pa., and John Chipman, University of Michigan, Ann Arbor, Mich.

6:30 P. M.—Hotel Pennsylvania Ballroom

Annual banquet. Speaker: Tom M. Girdler, chairman of board, Republic Steel Corp., Cleveland.

Presentation of medals.

Friday, Oct. 5

10:00 A. M.—Hotel Pennsylvania Ballroom

Grain Size Symposium

Grain Size in Metals with Special Reference to Grain Growth in Austenite, by M. A. Grossmann, Illinois Steel Co., Chicago.

General Relations Between Grain Size and Hardenability and the Normality of Steels, by E. S. Davenport and E. C. Bain, Research Laboratories, United States Steel Corp., Kearny, N. J.

Grain Size in Relation to Machinability and Other Properties of Bessemer Screw Steel, by H. W. Graham, Jones & Laughlin Steel Corp., Pittsburgh.

Grain Size Control of Open Hearth Carbon Steels, by S. Epstein, Battelle Memorial institute, Columbus, O., J. H. Nead, Inland Steel Co., Indiana Harbor, Ind., and T. S. Washburn, Inland Steel Co., Indiana Harbor, Ind.

The PF Characteristics of Steels, by B. F. Shepherd, Ingersoll-Rand Co., Phillipsburg, N. J.

Effect of McQuaid-Ehn Grain Size on Hardeness and Toughness of Automotive Steels, by H. W. McQuaid, Republic Steel Corp., Detroit.

2:00 P. M.—Port of Authority Building

Grain Size Symposium (continued)

Effect of McQuaid-Ehn Grain Size of Steel in Forging, by W. E. Sanders, Delco Products Division, General Motors Corp., Dayton, O.

Influence of Grain Size on the High Temperature Characteristics of Ferrous and Nonferrous Alloys, by A. E. White and C. L. Clark, University of Michigan, Ann Arbor, Mich.

The Importance of Grain Size of Sheet Steel for Deep Drawing, by R. L. Kenyon, American Rolling Mill Co., Middletown, O.

The Influence of Grain Size on Magnetic Properties, by W. E. Ruder, General Electric Co., Schenectady, N. Y.

Factors Determining the Impact Resistance of Hardened Carbon Steels, by Howard Scott, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Dr. V. N. Krivobok

1934 Campbell Memorial Lecturer, American Society for Metals

Society for Metals Dates Back to War Period

(*Concluded from Page 75*)

treatment of steel. In that year, a small group of men in Detroit met occasionally to discuss their common problems, and subsequently they established the Steel Treating Research society. This society soon had four chapters.

Interest in heat treating continued to grow and in 1918 another group organized in Chicago, adopting the designation of the American Steel Treaters' society. It set about on an intensive organization campaign and within a short time had nine chapters.

The two groups soon realized they had much in common and committees were appointed to bring about an amalgamation. This was consumated in September, 1920, at a convention and exposition in Philadelphia and the name of American Society for Steel Treating was adopted. The new organization started out with 27 chapters and a membership of 2000; today the society has 40 chapters and a membership of 5400. The name was changed to American Society for Metals at the beginning of 1934 to provide a designation more descriptive of the society's expanded scope.

Since its organization, the society has held conventions and expositions as follows:

1920	Philadelphia
1921	Indianapolis
1922	Detroit
1923	Pittsburgh
1924	Boston
1925	Cleveland
1926	Chicago
1927	Detroit
1928	Philadelphia
1929	Cleveland
1930	Chicago
1931	Boston
1932	Buffalo
1933	Detroit
1934	New York

Interesting Trips Arranged

VISITORS to the National Metal congress and exposition will be afforded the opportunity to inspect several manufacturing plants and laboratories in the New York district during the week of Oct. 1. Several companies and plants have extended the privilege of visitation. Contrary to the policy of past years, no definite schedule of trips is being arranged. The various plants will receive visitors on any morning of the week, unless otherwise indicated.

Inspections offered are as follows:

Dr. Albert Sauveur

In whose honor, the American Society for Metals has just established the Albert Sauveur Achievement Medal. Named the first recipient, he will receive the award at the Society's annual banquet

United States Navy Yard, Brooklyn, N. Y. (Open to citizens of the United States only.)

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

International Nickel Co. Inc., Research Laboratories, Bayonne, N. J. (Tuesday only.)

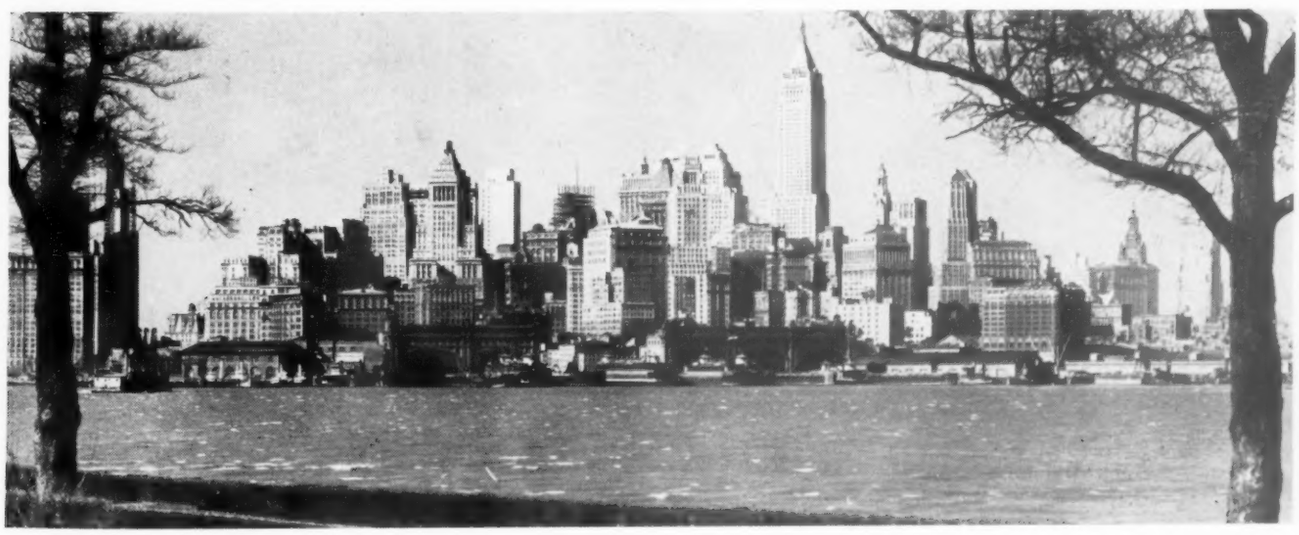
Eclipse Aviation Corp., Paterson, N. J.

Wright Aeronautical Corp., Paterson, N. J.

Singer Mfg. Co., Elizabethport, N. J.

International Motors Co., Plainfield, N. J.

Bell Telephone Laboratories Inc., Metallographic Laboratories, New York. (Tuesday and Wednesday only.)



—*Ewing Galloway photo*

Governors island affords this fine view of the famous lower Manhattan skyline

The Thermal Expansion Goggle Valve

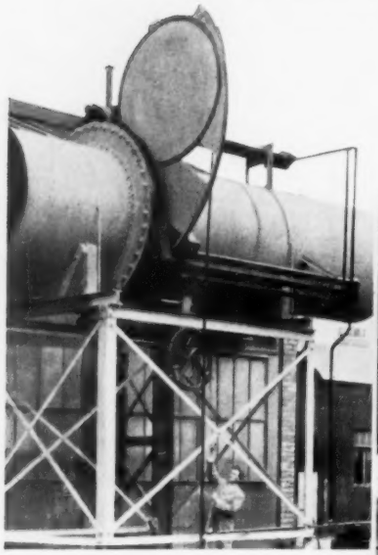
had to be the Best Gas Valve or we could not have made 150 satisfactory installations in the United States and 15 installations in Foreign Countries in the last eight years.

THIS VALVE HAS PROVEN ITS QUALITY AROUND THE WORLD

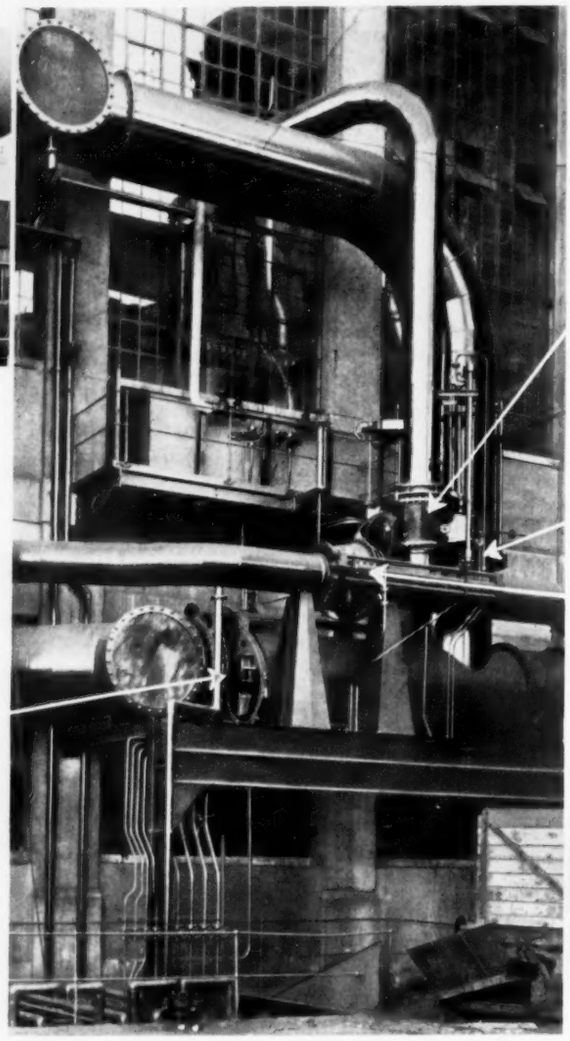
DUE TO ITS: Simplicity, Speed and Sureness of Operation.
Safety Assurance for Workmen.

DESIGN: Rugged, Powerful and Accessible, with all operating mechanism outside the gas main.

No gears, screws, toggles or other mechanical parts to corrode or clog and interfere with quick operation.



One of Three — 120″ Thermal Valves as they operate in India.



An Installation in England showing:
A Single Tube and a Three Tube Valve in *Vertical Gas Mains.*
A Single Tube and a Three Tube Valve in *Horizontal Gas Mains.*

APPLICABILITY: Easily Installed and Operated in Vertical or Horizontal Gas Mains, Hot or Cold, Dirty or Clean Gas Mains.

BUILT IN SIZES:
12″ to 120″ in diameter
for
Blast Furnace, Boiler Plant, Soaking Pit and Coke Oven Gas Mains

Single Tube Valve in Vertical Gas Main.

Three Tube Valve in Vertical Gas Main.

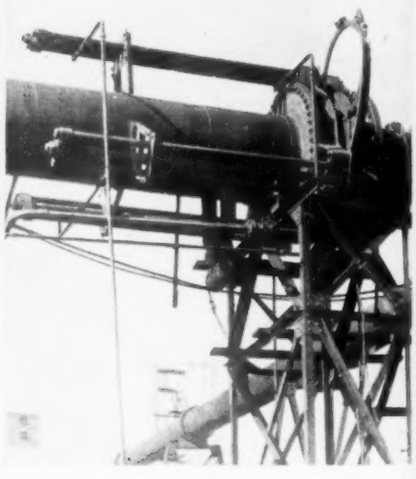
Single Tube Valve in Horizontal Gas Main.

Three Tube Valve in Horizontal Gas Main.

Complete Cycle of Operation 2 to 3 Minutes.

All sizes built for Steam or Electric Operation.

SATISFACTORY OPERATION GUARANTEED



A 78″ Thermal Expansion Valve as installed in South Africa.

May we prove the Efficiency of this Valve to You

William M. Bailey Company

Magee Building - - *ENGINEERS* - - Pittsburgh, Pa., U. S. A.

European Agents—Ashmore, Benson, Pease & Co., Ltd., Stockton-on-Tees, England

Built under United States and Foreign Patents

The ONE TEST

of A SPRING STEEL-SERVICE

BOOTH 335

National Metal Exposition
New York City
Oct. 1st to 5th

Metallurgists of the Vanadium Corporation of America will be in attendance to answer your questions concerning Vanadium Spring Steels and to give you some interesting data on Normalloy Forgings and Manganese-Vanadium Castings, Forgings, Plates and Shapes.

Of the many steels that have been tried in spring service, only a few have survived and of these, no other steels approach the proved records of Chrome-Vanadium Steel in leaf spring service and Silicon-Vanadium in heavy coil spring applications.

VANCORAM BRAND

VANADIUM CORPORATION OF AMERICA
120 BROADWAY NEW YORK, N. Y.
CHICAGO PITTSBURGH *Bridgeville, Pa.* DETROIT

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories at Bridgeville, Pennsylvania

FERRO-ALLOYS
of vanadium, silicon, chromium, titanium, and silico-manganese, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

VANADIUM STEELS

for strength, toughness and durability

Welding Society's Program Embraces a Wide Range

IN HOLDING its fourteenth annual fall meeting during the National Metal congress, the American Welding society continues a policy established eight years ago. All activities of this organization will center at the Hotel New Yorker. The program for the week's activities embraces one general meeting, six technical sessions, an educational conference, a board of directors dinner, and a stag banquet.

D. S. Jacobus
President, American Welding Society

Registration will commence on Monday morning, Oct. 1 and will continue throughout the day. In the afternoon, members and guests will assemble for an address of welcome by President D. S. Jacobus. At the conclusion of this address, the society will make the 1934 award of its Samuel Wylie Miller Memorial medal. This medal, established in 1929 in memory of S. W. Miller, who until his death served the society in an outstanding way, is presented annually for meritorius achievement which has contributed conspicuously to the advancement of the art of welding and cutting. The recipient's name is withheld until time of the award.

Following the medal award, the first technical session will start. Three papers are listed for presentation, one of them being on the timely subject of steel in residence construction. In the evening, the society's board of directors will hold a dinner meeting.

Two technical sessions are arranged for Tuesday, a general meeting with four papers for the morning, and a meeting on the subject of fundamental research with six papers during the afternoon.

In the evening, the fundamental research committee of the American Bureau of Welding, the society's research division, will hold a conference aimed to be of benefit to university research workers. H. M. Hobart, consulting engineer, General Electric Co., Schenectady, N. Y., and first vice director of the bureau, will preside.

For Wednesday two more sessions are scheduled, one in the morning and the other in the afternoon. The morning meeting, dealing with general welding topics, embraces four papers, and the afternoon meeting will concentrate upon welding in the railroad field, with three papers to be presented. One of the papers at the latter session is to deal with the fabrication of stainless steel for streamlined trains.

To Discuss A-C Welding

Another general session with four papers will be held on Thursday morning; two of the papers will be concerned with alternating-current arc welding, one with the impact resistance of some steels and welds at subzero temperatures, and the last with flame cutting. The concluding technical session on Thursday afternoon, will take the form of a symposium dealing with the qualifying of operators of welding equipment and expense incurred therein. Five papers on different subjects will be read.

Activities of the Welding society will be brought to a close with the annual banquet at Hotel New Yorker on Thursday evening. This year, this banquet will be stag.

The complete program of the American Welding society is as follows:

Monday, Oct. 1

9:30 A. M.—HOTEL NEW YORKER

Registration until 5:00 p. m.

2:30 P. M.—HOTEL NEW YORKER

Address of welcome by President D. S. Jacobus, Babcock & Wilcox Co., New York.

Presentation of Miller Memorial Medal.

Technical Session

STEEL IN RESIDENCE CONSTRUCTION, by F. T. Llewellyn, United States Steel Corp., New York.

USE OF POLARIZED LIGHT AS APPLIED TO WELDING PRODUCTS, by E. W. P. Smith, Lincoln Electric Co., Cleveland.

IMPACT RESISTANCE OF WELDED JOINTS, by W. Sparagen, secretary, American Bureau of Welding, New York.

6:30 P. M.—HOTEL NEW YORKER

Dinner of board of directors.

Tuesday, Oct. 2

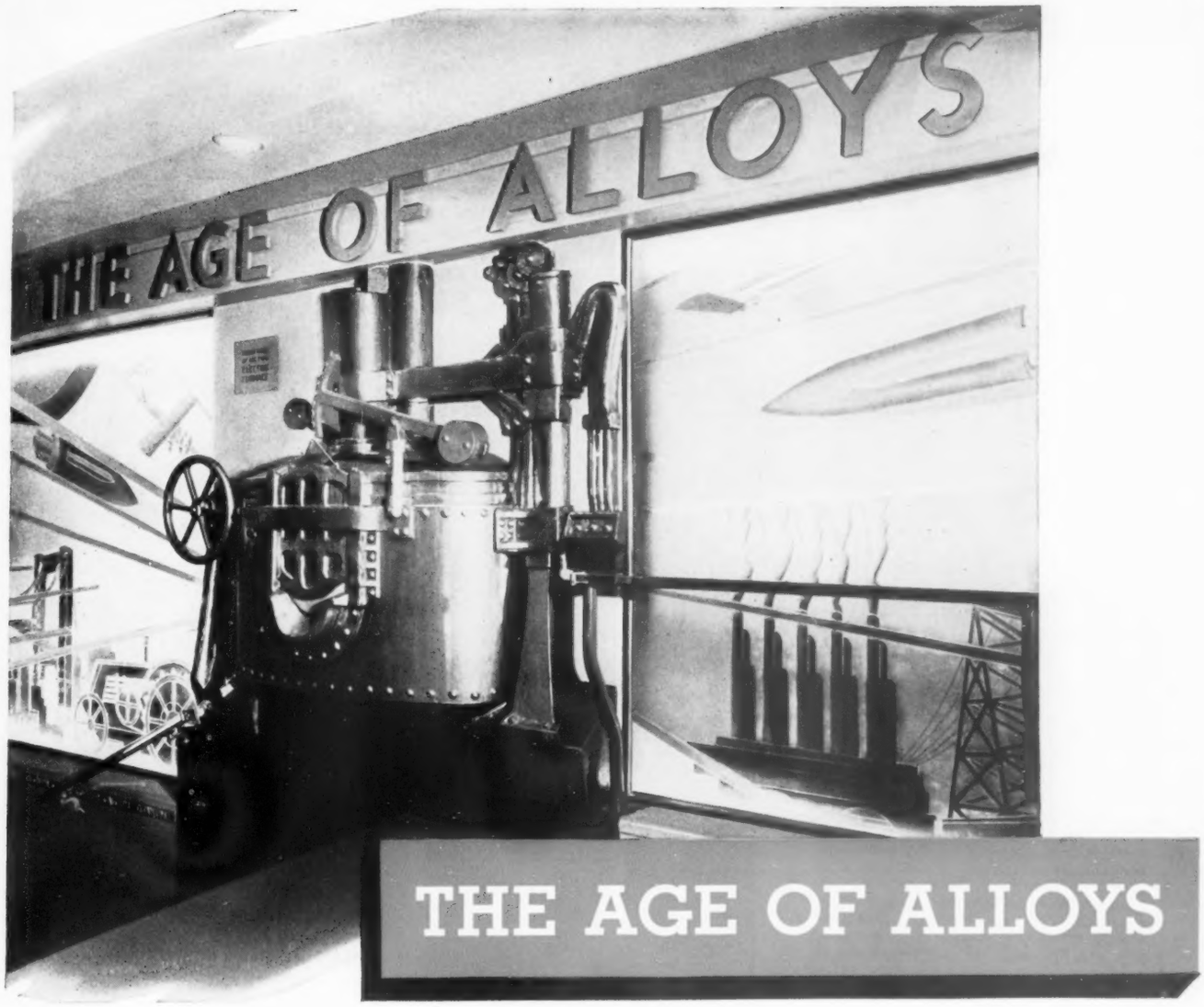
9:45 A. M.—HOTEL NEW YORKER

A CRITICAL EXAMINATION OF WELDED PIPE MATERIALS, by D. H. Corey, engineer, Detroit Edison Co., Detroit, and A. E. White, director, department of engineering research, University of Michigan, Ann Arbor, Mich.

INVESTIGATION OF WELDED SEAT ANGLE

(*Please turn to Page* 94)

A BIRD'S EYE view of Hotel New Yorker on Thirty-fourth street at Eighth avenue. This hotel will be headquarters for the American Welding Society and the Wire Association during the National Metal Congress



THE AGE OF ALLOYS

THE age of alloys is symbolized by the electric furnace, used in their production. Beauty, speed, lightness, strength and durability are descriptive of modern equipment fabricated of metal alloys. All transportation—rail and highway—water and air—is being made swifter and safer by their extra strength and lightness, machinery is stronger and more durable, and even our homes are more beautiful and livable because of these alloys.

Alloys in steel provide increased tensile strength and greater resistance to abrasion, impact, distortion, corrosion and fatigue. When designing or ordering new equipment remember that there is an alloy steel for every problem of strength and durability. Electromet engineers with the experience of years of research, are glad to give you all the information you desire on the use of alloys and alloy steels.

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation

NRA CODE

UCC

CARBIDE and CARBON BUILDING
30 EAST 42d ST., NEW YORK, N. Y.

Electromet
Ferro-Alloys & Metals

Welding Society's Program Embraces a Wide Range

(*Concluded from Page* 90)

CONNECTIONS, by Inge Lyse and N. G. Schreiner, Fritz engineering laboratories, Lehigh university, Bethlehem, Pa.

PHOTOELASTIC STUDIES OF SEAT ANGLE PROBLEMS, by Inge Lyse and Douglas M. Stewart, Fritz engineering laboratories, Lehigh university, Bethlehem, Pa.

WELDING IN ENGINEERING EDUCATION, by J. H. Zimmerman, Massachusetts Institute of Technology, Cambridge, Mass.

2:00 P. M.—HOTEL NEW YORKER

Fundamental Research

EFFECT OF PEENING ON PHYSICAL PROPERTIES OF WELDS AND STRESS RELIEF, by O. M. Harrelson, Georgia School of Technology, Atlanta, Ga.

NOTES ON THE FATIGUE TESTING OF WELDS, by J. H. Zimmerman, Massachusetts Institute of Technology, Cambridge, Mass.

SOME TESTS OF THERMIT WELDS, by Percy Hodge, Stevens Institute of Technology, Hoboken, N. J.

WELDING OF CAST IRON, by John A. Needy, dean, Ohio Northern university, Ada, Ohio.

RESIDUAL WELDING STRESSES, by R. E. Jamieson, McGill university, Montreal, Quebec.

WELDING OF CROMANSIL STEEL, by H. M. Boylston, head, department of metallurgical engineering, Case School of Applied Science, Cleveland.

7:30 P. M.—HOTEL NEW YORKER

Conference and meeting of fundamental research committee, American Bureau of Welding. Chairman H. M. Hobart, consulting engineer, General Electric Co., Schenectady, presiding. This conference is scheduled for the benefit of university research workers in the fundamentals of welding.

Wednesday, Oct. 3

9:45 A. M.—HOTEL NEW YORKER

SILVER SOLDERS AND FLUXES, by R. H. Leach, Handy & Harmon Co., New York.

METAL SPRAYING, by E. V. David, Air Reduction Sales Co., New York.

HARD FACING, by B. E. Field, chief metallurgical engineer, Haynes Stellite Co., Kokomo, Ind.

FLAME MACHINING, by representative of Linde Air Products Co., New York.

2:00 P. M.—HOTEL NEW YORKER

Railroad Session

TRACK MAINTENANCE, by I. H. Schram, engineer, maintenance of way, Erie railroad, Cleveland.

WELDED RAIL JOINTS IN MAIN LINE TRACK, by H. S. Clark, engineer, maintenance of way, Delaware & Hudson railroad, New York.

TECHNICAL PHASES OF APPLICATION OF WELDING IN HI-TENSILE DIVISION OF EDWARD G. BUDD MFG. CO., by M. B. Butler, Edward G. Budd Mfg. Co., Philadelphia.

Thursday, Oct. 4

9:45 A. M.—HOTEL NEW YORKER

A STUDY OF ALTERNATING-CURRENT ARC WELDING CIRCUIT CHARACTERISTICS, by A. M. Candy, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

AUTOMATIC ALTERNATING-CURRENT ARC WELDING CLASS I PRESSURE VESSELS, by O. A. Tilton, General Electric Co., Schenectady, N. Y.

IMPACT RESISTANCE OF SOME STEELS AND WELDS AT SUB-ZERO TEMPERATURES, by R. K. Hopkins, M. W. Kellog Co., Jersey City, N. J.

FLAME CUTTING, by Bradley Stoughton, Lehigh university, Bethlehem, Pa.

2:00 P. M.—HOTEL NEW YORKER

Symposium on Qualifying Operators of Welding Equipment and Expenses Incurred Therein

BOILER WELDING, by W. D. Halsey, Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn., and Alexander Kidd, M. W. Kellogg Co., Jersey City, N. J.

SHIPBUILDING, by E. D. Debes, Bethlehem Shipbuilding Co., Quincy, Mass., and H. W. Pierce, New York Shipbuilding Corp., New York.

STRUCTURAL WELDING, by Gilbert D. Fish, consulting engineer, Westinghouse Electric & Mfg. Co., New York.

PIPE WELDING, by Dr. S. Lewis Land, Heating and Piping Contractors National association, New York.

TESTING OF WELDERS, by J. W. Owens, director, National Weld Testing Bureau, Pittsburgh.

7:00 P. M.—HOTEL NEW YORKER

Annual stag banquet.

A. J. Boynton

Chairman, Iron and Steel Division, American Society of Mechanical Engineers

National officers of the American Welding society are: President, D. S. Jacobus, advisory engineer, Babcock & Wilcox Co., New York; senior vice president, J. J. Crowe, engineer in charge, apparatus research and development department, Air Reduction Co., Jersey City, N. J.; treasurer, C. A. McCune, secretary, Magnaflux Corp., New York; and secretary, M. M. Kelly, 33 West Thirty-ninth street, New York.

Divisional vice presidents include: New York and New England, A. G. Leake, president, Leake & Nelson Co., Bridgeport, Conn.; Pacific Coast, D. J. Williams, Pacific Coast manager, Air Reduction Sales Co., Los Angeles; Middle Eastern, W. W. Reddie, manager, welding section, industrial department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; Middle Western, C. L. Eksergian, chief engineer, Budd Wheel Co., Detroit; and Southern division, G. Raymond, chief engineer, Black, Sivalls & Bryson Inc., Oklahoma City, Okla.

Officers of the American Bureau of Welding, the research division of the society, are as follows: Director, C. A. Adams, professor, Harvard engineering school, Harvard university, Cambridge, Mass.; first vice director, H. M. Hobart, consulting engineer, General Electric Co., Schenectady, N. Y.; second vice director, J. H. Critchett, vice president, Union Carbide & Carbon Research Laboratories Inc., New York; and secretary, W. Spraragen, 33 West Thirty-ninth street, New York.

Membership in the society is approximately 1400.

A.S.M.E. Holding Metals Lectures

PARTICIPATION of the American Society of Mechanical Engineers in the National Metal congress will consist of two special and highly interesting lectures, one on nonferrous metals and the other on ferrous metals. Two of the country's leading metallurgists will be the lecturers. The program is arranged under the joint sponsorship of the society's Iron and Steel Division and its New York Metropolitan section.

Dr. Zay Jeffries, consulting metallurgist, Aluminum Co. of America, Cleveland, will present the first lecture at 5:30 p.m., Tuesday, Oct. 2, in the Port of Authority building. His subject will be "Nonferrous Metals Today and Tomorrow."

The second lecture, to be presented at 5:30 p.m., Friday, Oct. 5, also in the Port of Authority building, will be by Robert S. Archer, chief metallurgist, Republic Steel Corp., Chicago. His subject will be "Iron and Steel Today and Tomorrow."

Both lectures will be highly practical in scope and are planned to outline the various working characteristics of metals and their alloys, including such factors as cost, machinability, strength, toughness, hardness, and heat treatability. Because of the wide interest in these subjects and the popular appeal of the lectures, a large attendance of mechanical engineers and others is anticipated.

A. J. Boynton, vice president, H. A. Brassert & Co., Chicago, is chairman of the Iron and Steel Division of the American Society of Mechanical Engineers; and P. T. Wetter, 29 West Thirty-ninth street, New York, is meetings and divisions assistant.

Two Divisions of A. I. M. E. Will Discuss Metallurgy

COMPREHENSIVE programs have been arranged by the Iron and Steel Division and Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers for their annual fall meetings to be held Oct. 1-4 in conjunction with the National Metal Congress. Headquarters for the institute will be at Hotel Pennsylvania.

The Institute of Metals Division holds its first meeting on Tuesday morning, this session being devoted to equilibrium diagrams. On Tuesday afternoon, the Iron anl Steel and Institute of Metals Divisions will conduct a joint session on metallography.

Simultaneous sessions of the two divisions are scheduled for Wednesday morning. The Institute of Metals Division will devote its attention to die casting; the Iron and Steel Division will discuss raw materials. Both will adjourn at 11:00 a. m. to attend the A.S.M Campbell Memorial lecture.

L. F. Reinartz

Chairman, Iron and Steel Division, American Institute of Mining and Metallurgical Engineers

At noon on Wednesday, the executive committee of the Iron and Steel division will hold a luncheon meeting. In the afternoon, the Iron and Steel and Institute of Metals Divisions will hold their second joint meeting, this session to be conducted at the Port of Authority building. Three speakers will present papers on die casting and other hot working dies.

Activities for the day will be brought to a close with the annual dinner of the two divisions to be served at Hotel Pennsylvania in the evening.

Symposium on Slag Control

Both divisions will hold simultaneous sessions morning and afternoon on Thursday and these will close their activities for the week. The Iron and Steel Division will center its attention at both sessions to slag control in a wide range of pig iron and steelmaking operations. Nine papers will be presented and discussed at the two meetings. The two sessions of the Institute of Metals Division will be devoted to theoretical metallurgy.

The executive committee of the Institute of Metals Division will meet at luncheon on Thursday noon.

Detailed programs for the two divisions are as follows:

Monday, Oct. 1

10:00 A. M. —HOTEL PENNSYLVANIA

Registration Floor 18 until 5:00 p.m.

Tuesday, Oct. 2

10:00 A. M. —HOTEL PENNSYLVANIA

Institute of Metals

Equilibrium Diagrams

AN INVESTIGATION OF THE MUTUAL LIQUID SOLUBILITY OF ZINC AND LEAD WITH A DETERMINATION OF THE EUTECTIC COMPOSITIONS AND FREEZING POINTS BY THERMAL ANALYSIS, by R. K. Waring, E. A. Anderson, R. D. Springer and R. L. Wilcox.

THE HIGH-ZINC REGION OF THE COPPER-ZINC PHASE EQUILIBRIUM DIAGRAM, by E. A. Anderson, M. L. Fuller, R. L. Wilcox and J. L. Rodda.

EQUILIBRIUM RELATIONS IN ALUMINUM-NICKEL ALLOYS OF HIGH PURITY, by William L. Fink and L. A. Willey.

SECONDARY STRUCTURE AND THE AGE HARDENING OF CERTAIN ALLOYS, by K. H. Moore.

2:00 P. M.—HOTEL PENNSYLVANIA

Iron and Steel and Institute of Metals Divisions

Metallography

ORIENTATION OF FERRITE IN PEARLITE, by Robert F. Mehl and D. W. Smith.

USES OF THE POLARIZING MICROSCOPE IN THE STUDY OF INCLUSIONS IN METALS, by S. L. Hoyt and M. A. Scheil.

GRAPHITE IN LOW-CARBON STEEL, by A. B. Kinzel and R. W. Moore.

Wednesday, Oct. 3

9:30 A. M.—HOTEL PENNSYLVANIA

Institute of Metals

Die Casting

EFFECT OF COMPOSITION ON MECHANICAL PROPERTIES AND CORROSION RESISTANCE OF ALUMINUM ALLOY DIE CASTINGS, by E. H. Dix Jr. and J. J. Bowman.

DIE CASTING OF BRASS, by John R. Freeman Jr.

STUDIES OF PHASE CHANGES DURING AGING OF ZINC ALLOY DIE CASTINGS AND THEIR TECHNOLOGICAL SIGNIFICANCE; I—EUTECTOIDAL DECOMPOSITION OF BETA ALUMINUM ZINC PHASE AND ITS RELATION TO DIMENSIONAL CHANGES IN DIE CASTING, by M. L. Fuller and R. L. Wilcox.

ROLE OF THE SPECTOGRAPH IN CONTROL OF DIE CASTINGS PRODUCTION, by T. A. Wright.

Adjournment at 11:00 a.m. for Campbell Memorial Lecture of American Society for Metals.

9:30 A. M.—HOTEL PENNSYLVANIA

Iron and Steel Division

Raw Materials

GENESIS AND DEVELOPMENT OF BLAST FURNACES FROM 6000 B. C., by Charles Hart.

J. L. Christie

Chairman, Institute of Metals Division, American Institute of Mining and Metallurgical Engineers

MANUFACTURE, PROPERTIES AND USES OF SPONGE IRON, by G. B. Waterhouse.

Adjournment at 11:00 a.m. for Campbell Memorial Lecture of American Society for Metals.

12:30 P. M.—HOTEL PENNSYLVANIA

Executive committee luncheon, Iron and Steel Division.

2:00 P. M.—PORT AUTHORITY BUILDING

Iron and Steel and Institute of Metals Divisions

Die Casting and Other Hot Working Dies

STEELS FOR DIE CASTING DIES, by Sam Tour.

PROPERTIES OF SOME BRASS DIE CASTING ALLOYS, by O. B. Malin and W. W. Sieg.

HOT-WORKING DIE STEELS, by James P. Gill.

6:30 P. M.—HOTEL PENNSYLVANIA

Iron and Steel and Institute of Metals Divisions

Annual dinner. Speaker: Sam Tour, vice president, Lucius Pitkin Inc., New York, on the subject of DIE CASTINGS.

Thursday, Oct. 4

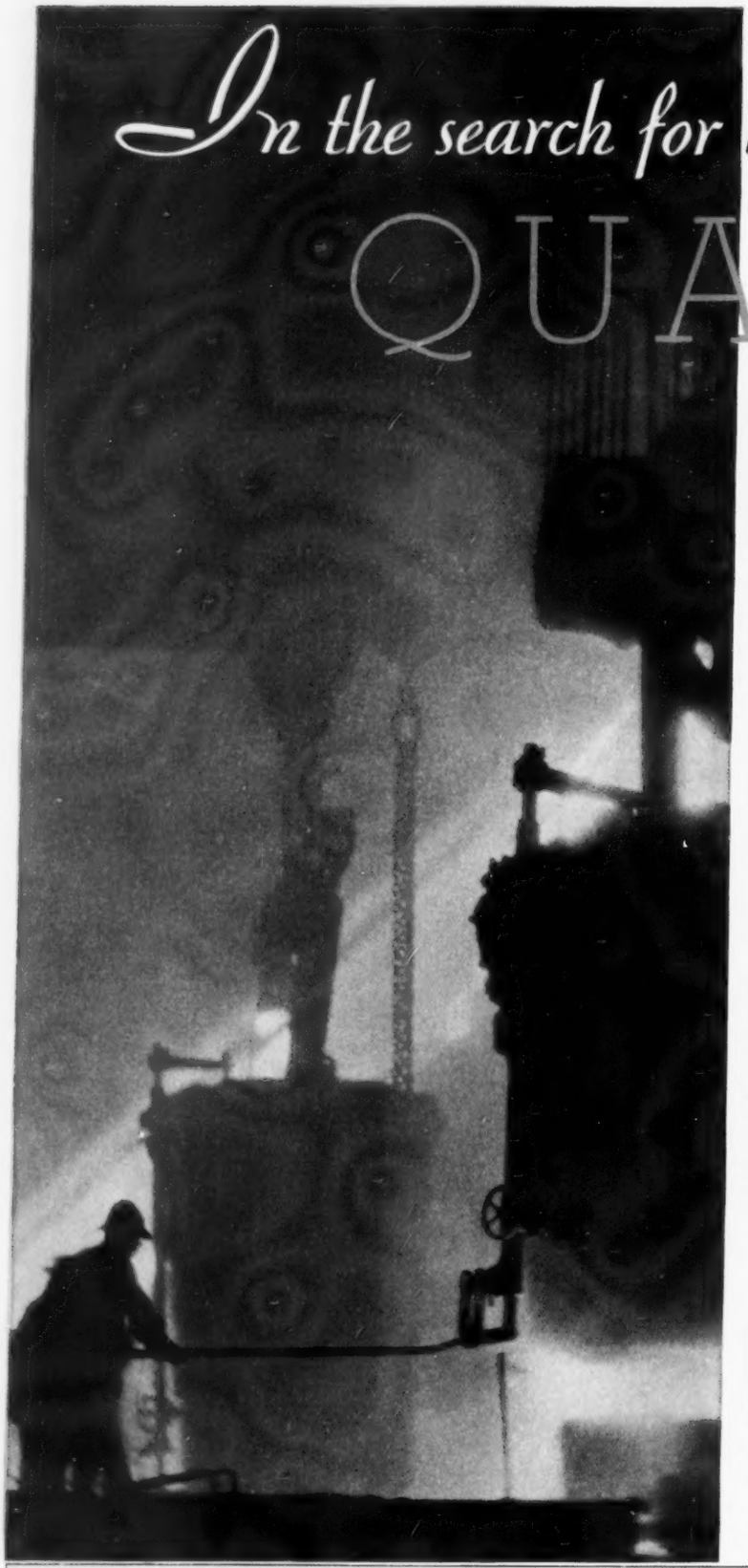
9:30 A. M.—HOTEL PENNSYLVANIA

Iron and Steel Division

Slag Control

SLAG CONTROL AND THE BLAST FURNACE.

(Please turn to Page 102)



In the search for better and better QUALITY

THROUGHOUT the history of American metallurgy runs the tireless search for better and better quality — cleaner, more homogeneous metals, — finer finished products. And the Titanium Alloy Manufacturing Company has been — still is! — a pioneer in this search.

Producing nearly 30 years ago, the first commercial Titanium Alloy for use in molten steel, TAMCO since then has developed TAM Alloys for practically every class of steel, as well as alloys for other metals.

The two TAM Ferro Carbon Titanium Alloys — TAM *Original* F. C. T. and TAM *Low Carbon* F. C. T. — are outstanding Titanium deoxidizers helping to produce superior steels, from the highest carbon down to the lowest carbon made! Supporting these leaders is a comprehensive list of TAM Alloys and Products for all needs of the practical metallurgist. TAM Standard Low Carbon Ferro Titanium (for cast iron), Webbite (for aluminum), Cupro-Titanium (for copper), Metallic Titanium, Metallic Zirconium, Tizgud (for mold facing), Fluxes (for slags and welding), Refractories and Cements—to name just a few.

A TAM engineer is always ready and willing to assist your plant with accurate, up-to-the-minute information.

ANNOUNCEMENT

TAMCO now offers a full line of Molybdenum Products: TAM Roasted Molybdenum Concentrates, TAM Ferro Molybdenum and TAM Calcium Molybdate.

May we talk with you at the National Metals Exposition, October 1 - 5? Our Booth is No. 484 in Commerce Hall, New York City.

THE TITANIUM ALLOY MANUFACTURING CO.

General Offices and Works:
Niagara Falls, N.Y., U.S.A.

Canadian Representatives
Railway & Power Eng. Corp. Ltd.
Toronto, Montreal, Hamilton,
Winnipeg, Vancouver, Sydney

Manufacturers of
Ti Zr Mo PRODUCTS

Pacific Coast Representatives
Balfour, Guthrie & Co.
San Francisco, Los Angeles, Portland, Seattle, Tacoma

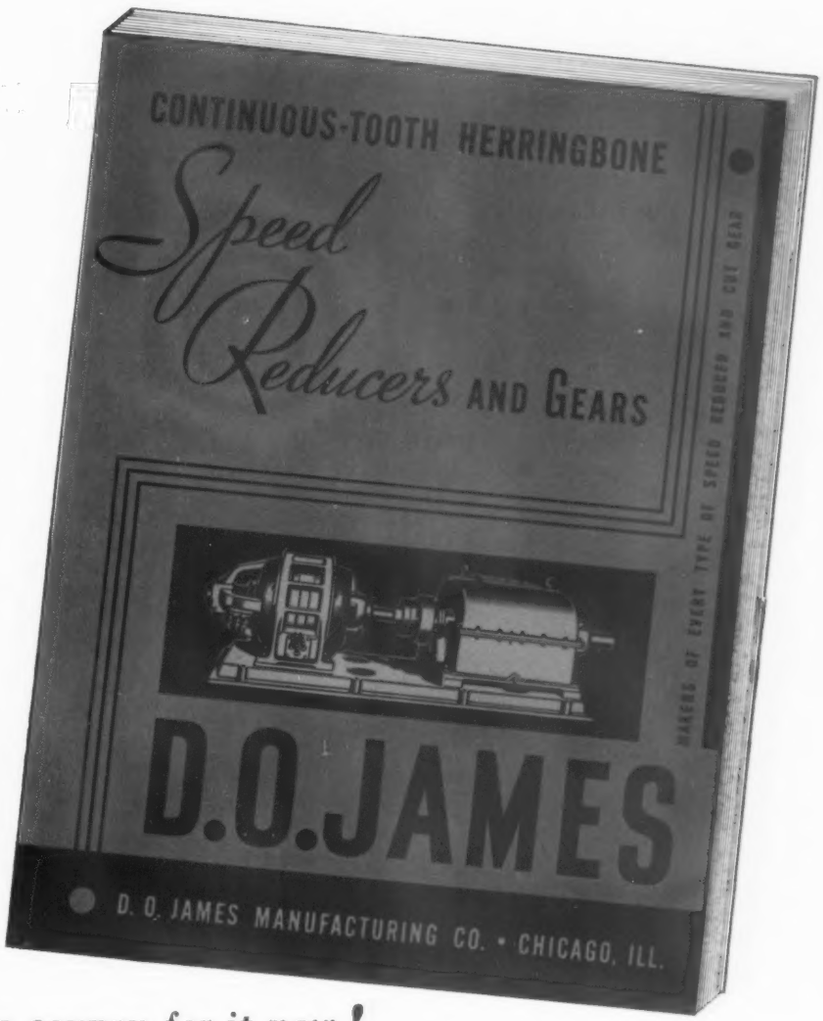
Executive Offices:
111 Broadway, New York City

European Representatives
T. Rowlands & Co., Ltd.
23-27, Broomhall St.,
Sheffield, England

Testifying to operating superiority

This Book belongs on your desk

We have compiled, from our engineering data, a new catalog containing complete specifications and practical working data on Continuous-Tooth Herringbone Speed Reducers and Gears. • • • The information contained in this catalog will solve many power transmission and speed reduction problems confronting the Plant Engineer. These recommendations are based upon actual applications of Continuous-Tooth Herringbone Speed Reducers and Gears in the Various Industries. They make possible the selection of the most efficient gear ratio for each given operation as affects efficiency and power economy. • • • We believe this catalog to be the most complete reference on Herringbone Gear application available today.


CONTINUOUS-TOOTH HERRINGBONE
Speed Reducers AND GEARS
MAKERS OF EVERY TYPE OF SPEED REDUCER AND CUT GEAR
D.O.JAMES
D. O. JAMES MANUFACTURING CO. • CHICAGO, ILL.

Mail the coupon for it now!

D. O. JAMES MANUFACTURING CO.
ESTABLISHED 1888
All Types Speed Reducers and Gears
1120 WEST MONROE STREET
CHICAGO, ILLINOIS

D. O. James Manufacturing Co.
1114 W. Monroe St., Chicago, Ill.

SEND COPY OF CATALOG NO. 137—A 96-page Reference Book on Herringbone Gear Application.

Name of Company .....

Name of Individual .....

Address .....

City ..... *State* .....

Two Divisions of A.I.M.E. Will Discuss Metallurgy

(*Concluded from Page 97*)

SLAG CONTROL FOR RIMMING STEEL, by L. F. Reinartz.
SLAG CONTROL FOR MEDIUM-CARBON FORGING STEEL.
SLAG CONTROL FOR HIGH-CARBON STEEL, by W. J. Reagan.
SLAG CONTROL FOR RECARBURIZED RAIL STEEL, by A. F. Miller and T. S. Washburn.
SLAG CONTROL FOR ALLOY FORGING STEEL.
SLAG CONTROL FOR ACID OPEN-HEARTH STEEL, by F. B. Foley and M. Furness.
SLAG CONTROL FOR ELECTRIC FURNACE STEEL.
CHEMICAL AND PHYSICAL TESTS FOR SLAG CONTROL, by C. H. Herty Jr. and A. B. Kinzel.
OPEN-HEARTH SLAGS—THEIR MINERAL CONSTITUTION.

10:00 A. M. —HOTEL PENNSYLVANIA

Institute of Metals

Theoretical Metallurgy

INFLUENCE OF A GRAIN BOUNDARY ON DEFORMATION OF A SINGLE CRYSTAL, by Richard F. Miller.
EFFECT OF QUENCHING STRAINS ON LATTICE PARAMETER AND HARDNESS VALUES OF HIGH PURITY ALUMINUM-COPPER ALLOYS, by Arthur Phillips and R. M. Brick.
X-RAY STUDY OF ORIENTATION CHANGES IN COLD-ROLLED SINGLE CRYSTALS OF ALPHA BRASS, by Carl H. Samans.

12:30 P. M.—HOTEL PENNSYLVANIA

Executive committee luncheon, Institute of Metals division.

2:00 P. M.—HOTEL PENNSYLVANIA

Iron and Steel Division

Slag Control

Continuation of morning session on the same subject.

2:00 P. M.—HOTEL PENNSYLVANIA

Institute of Metals

Theoretical Metallurgy

RATES OF PRECIPITATION IN ALUMINUM-RICH, ALUMINUM-SILVER ALLOYS, by A. Hone.
CORRELATION OF EQUILIBRIUM RELATIONS IN BINARY ALUMINUM ALLOYS, by W. L. Fink and H. R. Freche.
INTERMETALLIC SOLID SOLUTIONS, by E. R. Jette.

The two divisions of the American Institute of Mining and Metallurgical Engineers at the close of 1933 embraced a membership of 2756, of which 1328 were enrolled in the Iron and Steel Division and 1428 were in the Institute of Metals Division.

Officers of the Iron and Steel Division are as follows: Chairman, L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O.; past chairman, John Johnson, director of research, research laboratories, United States Steel Corp., Kearny, N. J.; vice chairman, James Aston, professor of mining and metallurgy, Carnegie Institute of Technology, Pittsburgh; vice chairman, H. W. Gillett, director, Battelle Memorial institute, Columbus, O.; vice chairman, Jerome Strauss, chief research engineer, Vanadium Corp. of America, Bridgeville, Pa.; and secretary, A. B. Kinzel, metallurgist, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.

The executive committee consists of: W. J. MacKenzie, Youngstown Sheet & Tube Co., Chicago; C. B. Murray, partner, Crowell & Murray Inc., Cleveland; G. A. Reinhardt, metallurgical engineer, Youngstown Sheet & Tube Co., Youngstown, O.; F. B. Foley, superinendent of research, Midvale Co., Philadelphia; J. H. Nead, chief metallurgist, Inland Steel Co., East Chicago, Ind.; F. B. Richards, Cambridge, Mass.; A. V. deForest, consulting engineer, New York; H. W. Graham, general metallurgist, Jones & Laughlin Steel Corp., Pittsburgh; F. C. Langenberg, United States Cast Iron Pipe & Foundry Co., Burlington, N. J.; and honorary member, John A. Mathews, metallurgist and vice president, Crucible Steel Co. of America, New York.

Institute of Metals Officers

Officers of the Institute of Metals Divsion are as follows: Chairman, J. L. Christie, metallurgist, Bridgeport Brass Co., Bridgeport, Conn.; past chairman, T. S. Fuller, metallurgist, research laboratories, General Electric Co., Schenectady, N. Y.; vice chairman, W. M. Peirce, assistant to chief of research, research division, New Jersey Zinc Co., Palmerton, Pa.; vice chairman, W. A. Scheuch, works manager, Nassau Smelting & Refining Co. Inc.; Tottenville, N. Y.; secretary, E. M. Wise, metallurgist, International Nickel Co. Inc.; Bayonne, N. J.; and treasurer, W. M. Corse, consulting metallurgist, Washington.

Executive committee members are: H. A. Bedworth, metallurgist, American Brass Co., Waterbury, Conn.; D. K. Crampton, director of research, Chase Brass & Copper Co., Waterbury, Conn.; E. H. Dix Jr., metallurgist, aluminum research laboratories, Aluminum Co. of America, New Kensington, Pa.; J. A. Gann, metallurgist, Dow Chemical Co., Midland, Mich.; G. O. Hiers, metallurgist, research laboratories, National Lead Co., Brooklyn, N. Y.; R. H. Leach, mining engineer, Handy & Harman, Bridgeport, Conn.; R. F. Mehl, director, metals research laboratory, Carnegie Institute of Technology, Pittsburgh; J. Walter Scott, metallurgical engineer, Hawthorne works, Western Electric Co., Chicago; and Jerome Strauss, chief research engineer, Vanadium Corp. of America, Bridgeville, Pa.

STEEL at the Metal Show

THROUGHOUT the National Metal exposition STEEL will maintain headquarters in Booth 289, which will be outfitted as a restroom for the convenience of visitors. Publications of the Penton Publishing Co., including STEEL, *Daily Metal Trade*, *The Foundry*, *Abrasive Industry and Machine Design*, will be available here. Representatives in attendance will be: E. L. Shaner, editor of STEEL; G. O. Hays, business manager; E. C. Kreutzberg, engineering editor; E. F. Ross, associate editor; J. D. Knox, associate editor; B. K. Price, associate editor; L. E. Browne, associate editor; John Henry, business representative; J. F. Ahrens, business representative; E. W. Kreutzberg, business representative; J. W. Zuber, business representative; J. D. Pease, vice president, Penton Publishing Co.; H. B. Veith, associate editor, *Machine Design;* and C. G. Stewart, nonferrous editor, *Daily Metal Trade*.

An imposing view of the George Washington bridge, looking toward the northwest from Manhattan island. This beautiful bridge, completed in 1932 crosses the Hudson river between 178th street, New York, and Fort Lee, N. J.

Wire Association To Deal With Manufacturing Problems

PROBLEMS incident to the manufacture and treatment of wire will occupy the time of members of the Wire association, which for the third successive year is holding its annual meeting in connection with the National Metal Congress. The association has selected the Hotel New Yorker for its headquarters..

Formal activities commence on Tuesday, Oct. 2, however, registration facilities will be open all day Monday, Oct. 1.

John Mordica
President, Wire Association

The opening technical session on Tuesday morning will be devoted to the topic of galvanizing and corrosion-resisting coatings as applied to wire. At the second session on Tuesday afternoon, electrolytic copper and lubrication are listed for consideration.

Annealing and heat treating and steel wire manufacture are subjects assigned for the morning session on Wednesday. In the afternoon, the association will conduct a joint meeting with the Braiding and Wire Covering Machinery Manufacturers association.

Late in the afternoon of Wednesday, the Wire Association will hold its annual business meeting. At the conclusion, the Wire association medal will be awarded. This medal is presente dfor meritorius service or achievement in connection with wire manufacturing.

Closing sessions will be held morning and afternoon on Thursday. The morning meeting will deal with spring wire and lime coating. The afternoon meeting will be devoted to copper wire.

The detailed program of the Wire association is as follows:

Monday, Oct. 1

HOTEL NEW YORKER

Registration all day informal meeting in afternoon.

Tuesday, Oct. 2

9:30 A. M.—HOTEL NEW YORKER

Galvanizing and Corrosion Resisting Coatings

CORROSION AND HOT GALVANIZING, by Allan B. Dove, chemical engineer, Canada works, Steel Co. of Canada Ltd., Hamilton, Ont.

GALVANIZING, by U. C. Tainton, consulting engineer, Baltimore.

2:00 P. M.—HOTEL NEW YORKER

Electrolytic Copper—Lubrication

SMELTING, CASTING AND ROLLING OF ELECTROLYTIC COPPER, by W. S. Adams, superintendent of rolling mills, and Mr. Miller, superintendent of furnace refinery, Anaconda Copper Mining Co., Great Falls, Mont.

LUBRICATION FOR DRAWING COPPER WIRE IN THREE STAGES—HEAVY, MEDIUM AND FINE, by John G. Richards, wire mill lubricating engineer, G. Whitfield Richards, Philadelphia.

Wednesday, Oct. 3

9:30 A. M.—HOTEL NEW YORKER

Annealing and Heat Treating—Steel Wire Manufacture

BRIGHT ANNEALING OF WIRE IN ELECTRIC FURNACES, by O. S. Haskell, industrial heating engineering department, General Electric Co., Schenectady, N. Y.

STEEL WIRE MANUFACTURE, by F. H. Nullmeyer, Youngstown Sheet & Tube Co., Youngstown, O.

2:00 P. M.—HOTEL NEW YORKER

Joint session with Braiding and Wire Covering Machinery Manufacturers Association

COVERING OF WIRE BY BRAIDING, by S. B. Blaisdell, Fidelity Machine Co., Philadelphia.

COVERING OF WIRE BY WINDING AND ENAMELING, by R. W. Withington, American Insulating Machinery Co., Philadelphia.

HIGH SPEED CARRIER DEVELOPMENTS, by R. V. Olsen, Mossberg Pressed Steel Corp., Attleboro, Mass.

4:00 P. M.—HOTEL NEW YORKER

Annual meeting of Wire association. Presiding: President John Mordica, superintendent, rod and wire works, Bethlehem Steel Co., Sparrows Point, Md.

Award of Wire association medal.

Thursday, Oct. 4

9:30 A. M.—HOTEL NEW YORKER

Spring Wire—Lime Coating

PROPERTIES AND MANUFACTURE OF SPRING WIRE, by E. J. P. Fisher, physical metallurgist, Keystone Steel & Wire Co., Peoria, Ill.

LIME COATING OF ROD VERSUS SILICATE OR SODA OR TRISODIUM PHOSPHATE, by H. G. Hobbs, Cleveland.

2:00 P. M.—HOTEL NEW YORKER

Copper

CANADIAN COPPER FROM MINE TO WIRE USER, by D. Horsfall, Canada Wire & Cable Co., Toronto, Ont.

The Wire association is a nonprofit organization of wire mill executives,

(*Please turn to Page* 110)

THE Port of Authority building as it appears from Eighth avenue looking toward the Hudson river and Ninth avenue. This mammoth building will house the Sixteenth National Metal Exposition with all exhibits located on one floor

you CAN'T miss us

AT THE NATIONAL METAL EXPOSITION

Welcome!

BOOTH
133
OCTOBER
1-2-3-4-5
1934

Come to the Republic Exhibit this year expecting to see something different, and you will not be disappointed. A visit will prove a liberal education and an inspiration.

Here you will find tangible evidence showing what other steel users have done by taking advantage of the progress made during the last year by the world's largest producer of alloy steels. Here you will find new alloys developed to meet new needs—stainless steels applied to combat heat and corrosion as encountered in almost every industry.

Metallurgists who really know steels will be on hand to answer your questions—to help you with your steel problems—and to offer suggestions.

Meet your friends in Republic's Exhibit where you can spend waiting time to good advantage. You are always welcome.

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES: YOUNGSTOWN, OHIO

REX CHAIN

FOR EVERY DRIVE & CONVEYOR

REX Z-METAL CHAINS

THE GREATEST CHAINS EVER CAST

Stronger, Tougher, Harder for Longer, Harder Wear

REX "Z" METAL CHAIN

is cast and heat-treated by processes which give it characteristics unknown in cast chains before. It is an application of the Chain Belt Company's, developed by this company, and made by it exclusively.

STRENGTH

Rex Z-Metal Chains are from 30% to 40% stronger than good malleable chains of the same number.

HARDNESS

Rex Z-Metal Chains offer a greater degree of hardness than malleable iron—hence are much more resistant to abrasive wear.

PRECISION

Rex Z-Metal casts very accurately so Rex Z-Metal Chains are accurately true to pattern, securing exact sprocket fits, so important in the life of chain and sprockets.

RESISTANCE TO CORROSION

Rex Z-Metal Chains are considerably more resistant to the corrosive action of both organic and inorganic acids than malleable chains. In practically all corroding solutions the action is considerably retarded.

POUNDING

Because of the greater strength and high yield point, Rex Z-Metal Chains will stand continuous heavy pounding.

If you are having trouble with:

1. Loads exceeding the yield point of malleable chain, causing stretching,
2. Rapid abrasive wear of malleable chain,
3. Failure due to corrosion or a combination of corrosion and abrasion,

Rex Z-Metal will usually solve the problem at *low cost*.

CHAIN BELT COMPANY, 1660 West Bruce Street, Milwaukee, Wisconsin

AVERAGE COMPARATIVE PHYSICAL PROPERTIES

	Ultimate Strength Lbs. Per Sq. In.	Yield Point Lbs. Per Sq. In.	Elongation in 2 In.	Brinell Hardness	Fatigue Limit Lbs. Per Sq. In.
Rex Z-Metal	80,000	55,000	14%	185-205	37,500
Cast Steel .20—.30 Carbon	70,000	40,000	25%	130-150	33,000
Cast Steel .40—.50 Carbon	80,000	45,000	20%	160-180	37,500
Forged Steel SAE1035	75,000	45,000	20%	140-160	37,500
Malleable	54,000	35,000	20%	120-140	28,000
Grey Iron (a good grade)	30,000	30,000	None	160-180	.....

Write for any desired data

CHAIN BELT COMPANY

CHAIN & BELT CONVEYING

Wire Association To Deal With Manufacturing

(*Concluded from Page* 105)

superintendents and foremen. It also includes plant engineers, traffic men, credit men, salesmen, and all others engaged in the wire industry, as well as manufacturers and other interests offering products of services to wire manufacturers. The specific purpose of the association is to improve production methods and afford a clearing house for ideas on management problems, technical problems, and research work in all phases of practical wire drawing and wire working, and to develop and maintain friendly relations among its members.

At present, the membership of the association comprises over 200 of the most representative production executives of the industry, whose companies account for about 80 per cent of the country's production.

Wire Association Officers

Officers of the Wire association are: President, John Mordica, superintendent, rod and wire works, Bethlehem Steel Co., Sparrows Point, Md.; vice presiaent, L. D. Granger, assistant to vice president, Wickwire Spencer Steel Co., New York; vice president, John C. Ward Jr., general works manager, General Cable Corp., White Plains, N. Y.; and secretary, Richard E. Brown, publisher, *Wire and Wire Products*, New York.

The board of directors is composed of the officers and the following: C. S. Barninghom, sales manager, New England Butt Co., Providence, R. I.; John C. Callaghan, works manager, Canada works, Steel Co. of Canada, Hamilton, Ont.; E. W. Clark, managing engineer, wire department, General Electric Co., Schenectady, N. Y.; Ralph K. Clifford, general superintendent, Continental Steel Corp., Kokomo, Ind.; George D. Hartley, treasurer and general manager, Sleeper & Hartley Inc., Worcester, Mass.; E. P. Kastien, purchasing agent, Keystone Steel & Wire Co., Peoria, Ill.; Kenneth B. Lewis, consulting engineer, Worcester, Mass.; John R. McKean, superintendent, American Electrical Works, Phillipsdale, R. I.; George A. Paff, superintendent, rod and wire department, wheeling Steel Corp.; Portsmouth, O.; and W. D. Pierson, secretary, Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

Exhibitors in National Metal Exposition

Port of Authority Building, New York, Oct. 1-5

Exposition Hours

Monday ..... **12:00 to 10:00 p. m.**
Tuesday ..... **12:00 to 10:00 p. m.**
Wednesday ..... **12:00 to 10:00 p. m.**
Thursday ..... **12:00 to 6:00 p. m.**
Friday ..... **12:00 to 10:00 p. m.**

A

ABRASIVE INDUSTRY, Cleveland 289
Publications and technical books.

Air Reduction Sales Co., New York 378
Welding and cutting torches; regulators; welding and cutting apparatus; oxygen and acetylene.

Ajax Electric Co. Inc., Philadelphia 374
Electric ammonia dissociator; electric heat treating furnaces.

Ajax Electrothermic Corp., Trenton, N. J. 374
Electric induction melting furnaces.

Allegheny Steel Co., Brackenridge, Pa. 241
Stainless and heat-resisting steels; alloy steels; sheet steel.

Allen, Edgar, Steel Co. Inc., New York 332
Alloy steels; tool steels; strip steel.

American Brass Co., Waterbury, Conn. 301
Welding rods; copper products.

American Electric Furnace Co., Boston....345, Gas Section
Electric, gas and oil heat treating furnaces.

American Gas Association, New York .....Gas Section
Industrial gas equipment.

American Gas Furnace Co., Elizabeth, N. J.....Gas Section
Heat treating furnaces; blowpipes and burners; retort carburizing furnaces; nitriding furnaces.

American Sheet & Tin Plate Co., Pittsburgh 142
Steel sheets.

American Steel & Wire Co., Chicago 142
Welding wire; stainless and heat-resisting steels; alloy steels; strip steel; cold finished bars.

Aurora Metal Co., Aurora, Ill. 431
Die castings.

B

Babcock & Wilcox Co., New York 273
Refractories.

Baldwin-Southwark Corp., Philadelphia. 333
Testing machines and testing equipment.

Bastian-Blessing Co., Chicago 325
Welding and cutting torches; regulators; oxygen and acetylene manifolds; acetylene generators.

Bausch & Lomb Optical Co., Rochester, N. Y. 350
Metallurgical microscopes; spectograph; optical and measuring instruments.

Bellis Heat Treating Co., Branford, Conn. 460
Salt bath furnaces and salts.

Bethlehem Steel Co., Bethlehem, Pa. 166
Alloy steel; structural shapes; stainless and heat-resisting steels; tool steels; bolts and nuts.

Blakeslee, G. S., & Co., Chicago 287
Metal washing and cleaning machines.

Boker, H., & Co. Inc., New York 121
Stainless steels; tool steels; alloy steels.

Botfield Refractories Co., Philadelphia 281
High-temperature fire brick cement; refractories.

Bristol Co., Waterbury, Conn. 362
Pyrometers; thermocouples; automatic temperature control equipment.

Brown Instrument Co., Philadelphia 145
Pyrometers; thermocouples, automatic temperature control equipment.

Brown-Wales Co., Boston 269
Tool steels; high speed steels; finishing steels; die steels; structural steels.

C

Carboloy Co. Inc., Detroit 370
Cemented carbide tools and dies.

Carborundum Co., Niagara Falls, N. Y., and Perth Amboy, N. J. 306, 310
Abrasives; grinding and cutting wheels; polishing grains; refractories; pyrometer tubes.

Carnegie Steel Co., Pittsburgh 142
Alloy steel; structural shapes; stainless and heat-resisting steels; steel sheets and strip.

Chapman Valve Mfg. Co., Indian Orchard, Mass. 472
Heat treating process.

Climax Molybdenum Co., New York 114
Chemical and metallurgical products of molybdenum.

Cling-Surface Co., Buffalo..... 106
Belt dressing.

D

DAILY METAL TRADE, Cleveland 289
Publications and technical books.

(*Please turn to Page* 113)

Exhibitors in National Metal Exposition (Continued from p. 110)

Dardelet Threadlock Corp., New York 278
Threaded bolts and nuts.

Delany Chemical Co., Philadelphia 459
Inhibitors and pickling compounds for wire.

Detroit Alloy Steel Co., Detroit 390
Alloy steels.

Dow Chemical Co., Midland, Mich. 107
Magnesium alloys; metal cleaner.

Driver-Harris Co., Harrison, N. J. 126
Heat and corrosion-resisting alloys.

Du Pont, E. I., de Nemours & Co., R. & H. Chemicals Dept., Wilmington, Del. 270
Heat treating salts; metallic sodium; plating salts and chemicals; metal cleaners.

E

Eastern Steel Castings 405
Steel castings.

Eisler Engineering Co. Inc., Newark, N. J. 442
Electric spot welders.

Electro Metallurgical Co., New York 162, 313
Ferroalloys.

Ensign-Reynolds Inc., New York ..... Gas Section
Soft metal melting furnaces; gas compressors; burners; air blowers.

F

Ferrous Magnetic Corp., Long Island City, N. Y. 435
Magnetic inspection equipment.

Ford, J. B., Co., Wyandotte, Mich. 346
Metal cleaners.

Forging & Casting Corp., Ferndale, Mich. 448
Centrifugally cast nitrided iron.

Foxboro Co., Foxboro, Mass. 242
Pyrometers; thermocouples; pyrometric instruments.

Frasse, Peter A., & Co., Inc. New York 158
Stainless steels; tool steels; alloy steels.

G

Gas Machinery Co., Cleveland ..... Gas Section
Furnaces; equipment for gas plants.

Gathmann Engineering Co., Baltimore 115
Ingot molds; ingot stripping equipment.

Gehnrich Corp., Long Island City, N. Y. ..... Gas Section
Ovens.

General Alloys Co., Boston 101
Heat and corrosion-resisting alloys.

General Electric Co., Schenectady, N. Y. 416
Electric furnaces; electric welding equipment.

General Electric X-Ray Corp., Chicago 393
Metallurgical x-ray testing equipment.

Globar Corp., Niagara Falls, N. Y. 306
High-temperature, nonmetallic heating elements.

Globe Machine & Stamping Co., Cleveland 444
Tumbling barrels.

Gogan Machine Corp., Cleveland 254
Hardness testing machines.

Grasselli Chemical Co., Cleveland 109
Inhibtors; fluxes; acids; chemicals for cadmium and zinc plating.

Great Lakes Steel Corp., Ecorse, Mich. 366, 379
Sheet steel; strip steel; alloy steel.

H

Harnischfeger Corp., Milwaukee 488
Electric arc welders; electric motors.

Hauck Mfg. Co., Brooklyn, N. Y. 267
Oil burners; regulating valves.

Hayes, C. I., Inc., Providence, R. I. 365
Electric heat treating furnaces.

Haynes Stellite Co., Kokomo, Ind. 162, 313
Cutting tools; welding rods.

Heppenstall Co., Pittsburgh 382
Die blocks; alloy steels; shear blades; heavy forgings.

Hevi Duty Electric Co., Milwaukee 411
Electric heat treating furnaces.

Hobart Bros. Co., Troy, O. 105
Electric arc welding machines.

Hollup Corp., Chicago 381
Welding electrodes; electric arc welders.

Hones, Charles A., Inc., Baldwin, N. Y. ..... Gas Section
Burners and appliances; melting furnaces; bench furnaces; tank heaters.

Houghton, E. F., & Co., Philadelphia 110, 169
Carburizers; industrial oils; belting; heat treating salts; rust preventatives; metal cleaners.

I

Illinois Steel Co., Chicago 142
Alloy steels; stainless steels; heat-resisting steels; sheets; wire; strip.

Illinois Testing Laboratories Inc., Chicago 253
Pyrometers; resistance thermometers.

International Nickel Co. Inc., New York 130
Nickel and nickel alloys for steel, cast iron and nonferrous alloys.

J

Jones & Laughlin Steel Corp., Pittsburgh 174
Hot and cold rolled steels; bessemer screw stock; S.A.E. steels.

K

Kelley-Koett Mfg. Co. Inc., Covington, Ky. 173
Metallurgical x-ray testing equipment.

Kemp, C. M., Mfg. Co., Baltimore ..... Gas Section
Gas premixers; lead melting units; burners.

L

Leeds & Northrup Co., Philadelphia 354
Heat treating furnaces; pyrometers; thermocouples.

Leitz, E., Inc., New York 118
Metallurgical microscopes; optical instruments; metallurgical grinding and polishing machines.

Lincoln Electric Co., Cleveland 102
Electric arc welding machines; welding supplies.

Linde Air Products Co., New York 162, 313
Welding and cutting torches; regulators; welding and cutting apparatus; oxygen and acetylene.

Lydon Bros., Newark, N. J. ..... Gas Section
Tempering ovens.

M

MACHINE DESIGN, Cleveland 289
Publications and technical books.

Macklin Co., Jackson, Mich. 467
Grinding wheels.

Madison-Kipp Corp., Madison, Wis. 423
Die casting machines; air tools and accessories.

Magnaflux Corp., New York 330
Magnetic inspection method.

Magnetic Analysis Corp., Long Island City, N. Y. 331
Magnetic inspection apparatus.

Manhattan Rubber Mfg. Division, Raybestos-Manhattan Inc., Passaic, N. J. 492
Wheels for grinding and finishing stainless steels and other materials.

Marburg Bros. Inc., New York 302
Cutting tools; die sawing and filing machines; measuring gages and devices; pneumatic hammers.

Maschinenfabrik Herborn, New York 455
Wire drawing machinery.

Mears-Kane-Ofeldt Inc., Philadelphia ..... Gas Section
Gas burners.

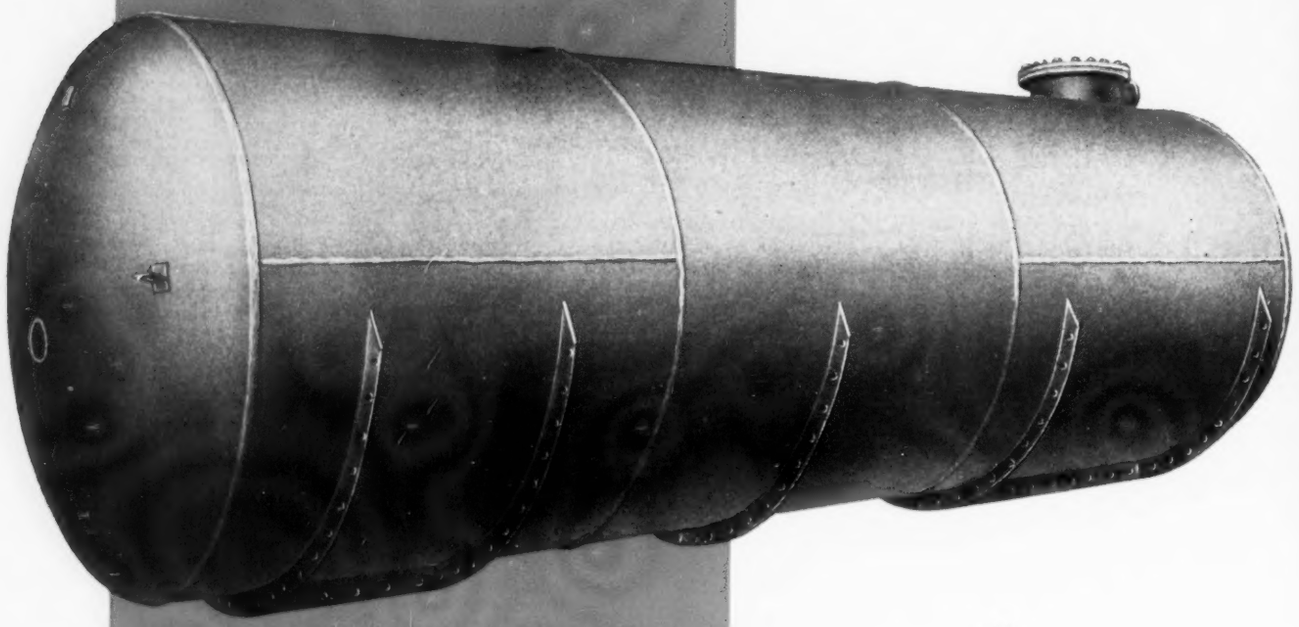
Metal & Thermit Corp., New York 383
Thermit welding materials and equipment; welding wire.

Mettler, Lee B., Co., Los Angeles ..... Gas Section
Gas burners.

Michigan Steel Casting Co., Detroit 394
Heat and corrosion-resisting castings.

(*Please turn to Page* 118)

BLAW·KNOX TANKS



for the U. S. Navy airplane carriers

Allegheny METAL CONTROLS CORROSION

Manufactured pursuant to License from the Chemical Foundation, Inc., under the basic patents No. 1,316,817 and No. 1,339,378.

THE safe storage of gasoline aboard Uncle Sam's war ships demanded tanks of special materials and special construction that combined absolute immunity to rust and salt air corrosion as well as *unusual strength.*

Hence, the use of ALLEGHENY Metal in the seamless construction of these gasoline storage tanks by the Blaw-Knox Company of Pittsburgh.

These smooth, sleek tanks are now in service on the bounding main aboard Uncle Sam's new cruisers and Airplane Carriers and illustrate only one of the many applications of this rustless, stainless metal in chemical process construction.

ALLEGHENY STEEL COMPANY

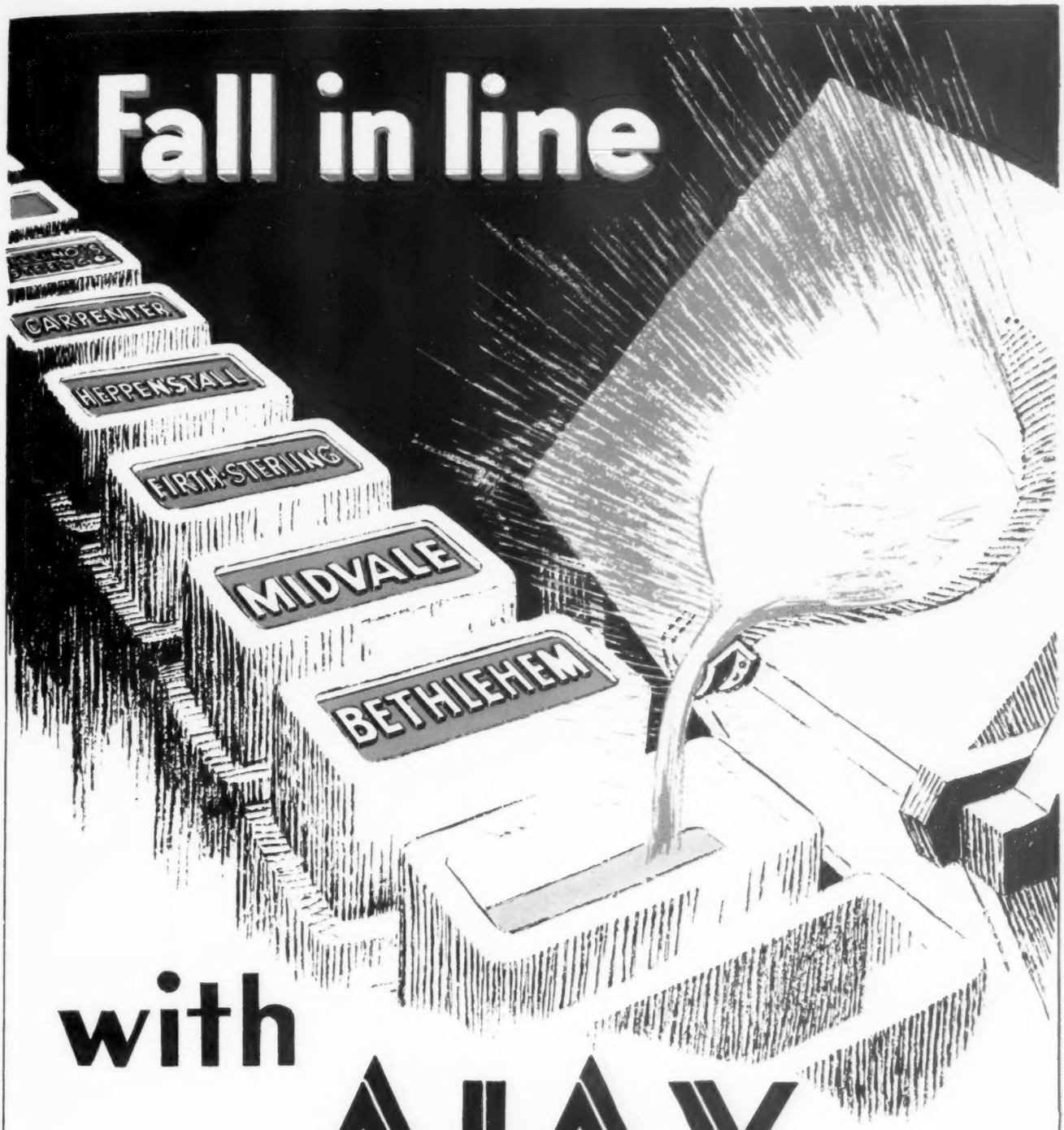
BRACKENRIDGE . . . PENNA.

Sales Offices and Warehouse Stocks in the Principal Cities . . . Stocks carried by JOS. T. RYERSON & SON, INC. WAREHOUSES

Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia and Jersey City . . . Dunham, Carrigan & Hayden Co., San Francisco; Union Hardware & Metal Co., Los Angeles

ALLEGHENY PRODUCTS: SHEETS FOR AUTOMOBILE BODIES, METALLIC FURNITURE, DEEP DRAWING, ALLEGHENY METAL, ALLEGHENY ALLOYS, ELECTRICAL SHEETS, STEEL CASTINGS, SEAMLESS TUBING, BOILER TUBES, PIPE

Fall in line



with

AJAX NORTHRUP

CORELESS INDUCTION FURNACES

AJAX ELECTROTHERMIC CORP., TRENTON, N. J.

G. H. CLAMER, Pres. & Gen. Mgr.

Visit Us at Booth 374
National Metal Exposition
October 1 to 5, 1934

E. F. NORTHRUP, V. Pres. & Tech. Adviser

Exhibitors in National Metal Exposition (Concluded from p. 113)

Midvale Co., Philadelphia 157
Forgings; rolls; tool steels; stainless and heat-resisting steels.

Milne, A., & Co., New York 332
Alloy steels; strip steels; tool steels.

Minneapolis-Honeywell Regulator Co., Minneapolis.... 255
Valves for industrial furnaces; automatic control systems; temperature and pressure control apparatus.

Molybdenum Corp. of America, Pittsburgh 122
Molybdenum alloys and compounds; tungsten and tungsten compounds.

Monarch Engineering & Mfg. Co., Baltimore....Gas Section
Heat treating furnaces.

Morse Twist Drill & Machine Co., New Bedford, Mass. 357
Drills; reamers; taps; dies; milling cutters.

N

National Carbon Co., Cleveland 162, 313
Carbon electrodes; carbon products.

National Tube Co., Pittsburgh 142
Steel tubes.

New Jersey Zinc Sales Co., New York 314, 318
Zinc and zinc alloys.

Norton Co., Worcester, Mass 337, 339
Grinding wheels; cutting wheels; refractories.

O

Oakite Products Inc., New York 369
Cleaning compounds.

Olsen, Tinius, Testing Machine Co., Philadelphia..... 321
Testing machines and testing equipment.

P

Page Steel & Wire Division, American Chain Co.
Monessen, Pa. 475
Welding wire.

Parker-Kalon Corp., New York.....412, Gas Section
Furnaces and screw machine products.

Partlow Corp., New Hartford, N. Y. .....Gas Section
Gas burners; thermostats.

Pels, Henry, & Co, Inc., New York..... 464
Billet shears; cut-off machines.

Penton Publishing Co., Cleveland 289
Publications and technical books.

Potts, Horace T., Co., Philadelphia 269
Tool steels; high speed steels; finishing steels; die steels; structural steels.

Pyrometer Instrument Co., New York 440
Pyrometers.

R

R-S Products Corp., Philadelphia .....Gas Section
Heat treating furnaces.

Radium Preparations Inc., New York 419
Radium salts.

Ransohoff, N., Inc., Cincinnati 291
Tumbling barrels; metal cleaning equipment.

Republic Steel Corp., Youngstown, O. 133
Alloy steels; sheets and strip; stainless and corrosion-resisting steels.

Roebling's, John A., Sons Co., Trenton, N. J. 398
Welding wire; strip steel.

Ryerson, Joseph T., & Son Inc., Chicago 322
Stainless steels; tool steels; alloy steels.

S

Scherr, George, Co. Inc., New York 134
Precision measuring and testing equipment.

Selas Co., Philadelphia .....Gas Section
Premixing machines for gas and air; gas burners; soldering systems; gas heated molding platen.

Shore Instrument & Mfg. Co., Jamaica, N. Y. 480
Hardness testing instruments.

Sivyer Steel Castings Co., Milwaukee..... 334
Steel castings; heat-resisting castings.

Spencer Turbine Co., Hartford, Conn. 251
Air compressors.

STEEL, Cleveland 289
Publications and technical books.

Steel & Tubes Inc., Cleveland 133
Steel tubes.

Stuart, D. A., & Co., Chicago 399
Industrial oils and greases.

Surface Combustion Corp., Toledo, O. .....Gas Section
Heat treating and forging furnaces; atmosphere equipment; burners.

T

Tagliabue, C. J., Mfg. Co., Brooklyn, N. Y. 283
Pyrometers; thermometers.

THE FOUNDRY, Cleveland 289
Publications and technical books.

Testing Machines Inc., New York 358
Testing machines and testing equipment.

Textile Machine Works, Reading, Pa. 401
Wire drawing machinery.

Titanium Alloy Mfg. Co., New York 484
Ferroalloys; titanium alloys and compounds.

Tridex Machine Corp., New York .....Gas Section
Metal cleaning machine.

Triplex Machine Tool Corp., New York 494
Special machines.

U

U S L Battery Corp., Niagara Falls, N. Y. 381
Electric arc welding machines.

Udylite Co., Detroit 274
Chromium and cadmium plating.

Una Welding & Bonding Co., Cleveland 476
Electric arc welding machines.

Union Carbide & Carbon Corp., New York.....162, 313
Welding and cutting apparatus; ferroalloys; carbon products; cutting tools; oxygen and acetylene.

United American Bosch Corp., Springfield, Mass.
.....Gas Section
Gas apparatus.

United States Steel Corp., New York 142
Sheet and strip steels; stainless and heat-resisting steels; tubes; structural steels; wire and wire products; alloy steels.

V

Vanadium Corp. of America, New York..... 335
Vanadium alloys and compounds.

Vapofier Corp., Chicago 258
Oil burners.

Victor Saw Works Inc., Middletown, N. Y. 384
Molybdenum steel hacksaw blades.

W

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. 456
Wire drawing machinery.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. 436, 473
Electric heat treating furnaces; electric welding machinery.

Wheelock, Lovejoy & Co. Inc., Boston 386
Alloy machinery steels; tool steels; special steels.

Wickwire-Spencer Steel Co., New York 138
Wire and wire products; heat and corrosion-resisting alloys.

Wilson Mechanical Instrument Co., New York 326
Hardness testers.

Wilson Welder & Metals Co. Inc., North Bergen, N. J. 378
Electric welding machines.

Y

Youngstown Sheet & Tube Co., Youngstown, O. 498
Sheets; tubes; wire; alloy steels.

Z

Zeiss, Carl, Inc., New York..... 397
Metallurgical microscopes; spectroscopes; magnifiers; precision measuring instruments.

Rate Up 2 Points; Strong Pressure on Prices

Lower Figures on Pig Iron and Cold Strip Sent to Institute, Then Withdrawn—Miscellaneous Buying Improves—Structural Awards Heavier—Good Export Inquiries

SLIGHTLY better demand from miscellaneous manufacturing sources and larger structural awards last week lifted the steelworks operating rate 2 points to 22½ per cent.

While buying is not brisk, steelmakers consider it as an indication of the widespread depletion of stocks, and of moderate seasonal expansion in some consuming industries.

Uncertainty over the iron and steel price structure became more pronounced last week, with open discussions regarding possibilities of adjustments, many users apparently withholding commitments pending further clarification.

Generally, iron and steel prices were advanced $1 to $8 a ton in the second quarter, but before they became effective reductions in July narrowed the increase to $1 to $4. Prices have not been tested by any broad buying movement for several months.

A Cleveland steelworks sent to the industry's code authority last week a reduction of $2.25 a ton on pig iron, and a Detroit producer filed a $5 cut on cold-rolled strip, both of which were withdrawn before becoming effective. Coupled with the former was a report that an automobile manufacturer was negotiating for 40,000 tons of pig iron. A filing of a $5 reduction in nails by a southern producer also has been held in abeyance. Prices of semifinished steel at Pittsburgh are reported to be insecure. Nuts and bolts are down approximately 20 per cent.

New Automobile Models To Be Introduced Gradually; Structural Tonnage Increases

Specifications for a little material for new automobile models are coming out, but fill-in requirements for completing present models are larger. The industry apparently will stagger the introduction of new models, and one large interest probably will not have its complete line on display until April. Ford is to curtail steel production, having built up stocks estimated at 125,000 tons. Output of automobiles last week, 38,000, was 500 less than in the preceding week.

Structural shape awards for the week—20,028 tons—were nearly three times as large as in the preceding week. Inquiries are expected out soon for 45,000 tons of structural material for new bridges and other improvements in Allegheny county (Pittsburgh).

In addition to 165,000 tons of wire, estimated to be required for the western tree belt, planned by the plains shelter belt administration, 55,000,000 fence posts will be needed, which if made of steel will take 192,500 tons. The army's ordnance division has been granted $2,300,000 by PWA for purchasing machine tools and inquiries are expected shortly. Pipe manufacturers find considerable demand developing from the government's home rehabilitation plans.

More Streamlined Trains; Argentina To Buy Steel; Iron Ore Shipments Curtailed

Illinois Central is issuing specifications for a streamlined train, and the Chicago, Milwaukee, St. Paul & Pacific is reported to have contracted for two streamlined locomotives, which with a Baltimore & Ohio locomotive, will be the first of this type designed to match the speed of other streamlined trains. Streamlined passenger cars for the Milwaukee line are to be built in its own shops.

The Argentine government is inquiring for 8000 to 15,000 tons of galvanized sheets for locust prevention, and 6000 tons of seamless steel pipe for its oil fields. Standard Oil is to purchase upward of 10,000 tons of steel for rebuilding its Argentine refineries, recently damaged by fire. American iron and steel imports in August—32,148 tons—were almost double those in July. For the eight months this year, however, the total—217,732 tons— is 13 per cent less than in the same period in 1933.

Due to the low rate of pig iron production for several months, Lake Superior iron ore shipments are slowing up, and leading producers now do not expect much more than 22,000,000 tons for the season, compared with 21,600,000 tons last year.

Steelworks operations in the Pittsburgh district last week advanced 3 points to 16 per cent; Wheeling 3 to 26; Cleveland 10 to 28; Buffalo 3 to 21; Birmingham 2 to 25; Youngstown 2 to 26; New England 3 to 28; eastern Pennsylvania 1 to 17. Chicago was off 2 to 22, while Detroit remained 77.

STEEL's iron and steel composite is down 1 cent to $32.13; the finished steel index unchanged at $54, and the iron and steel scrap figure off 4 cents to $9.33.

COMPOSITE MARKET AVERAGES

	Sept. 22	Sept. 15	One Month Ago Aug., 1934	Three Months Ago June, 1934	One Year Ago Sept., 1933	Five Years Ago Sept., 1929
Iron and Steel Composite	$32.13	$32.14	$32.24	$32.96	$30.36	$36.20
Finished Steel Composite	54.00	54.00	54.00	55.08	48.52	57.43
Steelworks Scrap Composite	9.33	9.37	9.98	10.32	10.83	16.39

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip and cast iron pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average forLast Month, Three Months and One Year Ago

	Sept. 22, 1934	Aug. 1934	June 1934	Sept. 1933
Finished Material				
Steel bars, Pittsburgh	1.80	1.80	1.90	1.60
Steel bars, Chicago	1.85	1.85	1.95	1.70
Steel bars, Philadelphia	2.09	2.09	2.09	1.91
Iron bars, Terre Haute, Ind.	1.75	1.75	1.85	1.60
Shapes, Pittsburgh	1.80	1.80	1.85	1.60
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.90	1.65
Tank plates, Pittsburgh	1.80	1.80	1.85	1.60
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.90	1.65
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	2.00	1.70
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.65	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.25	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	2.10	1.75
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.75	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.35	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.65
Wire nails, Pittsburgh	2.60	2.60	2.60	2.10
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$30.00	$26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	30.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	29.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	35.00

	Sept. 22, 1934	Aug. 1934	June 1934	Sept. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	$19.76	$19.76	$19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	17.76
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2 foundry, Chicago	18.50	18.50	18.50	17.50
Southern, No. 2, Birmingham	14.50	14.50	14.50	
No. 2X, Eastern del. Philadelphia	20.63	20.63	20.63	18.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.54
Gray forge, del. Pittsburgh	18.88	18.88	18.88	18.26
Ferromanganese, del. Pittsburgh	89.79	89.79	90.00	87.24
Scrap				
Heavy melting steel, Pittsburgh	$10.75	11.45	11.90	13.00
Heavy melt. steel, No. 2, east. Pa.	8.00	8.40	8.85	9.90
Heavy melting steel, Chicago	8.25	9.25	9.75	9.95
Rails for rolling, Chicago	9.75	10.50	11.25	11.25
Railroad steel specialties, Chicago	9.50	10.25	11.25	10.75
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.60	2.50
Connellsville, foundry, ovens	4.60	4.60	4.60	3.15
Chicago, by-product foundry, del.	9.25	9.25	9.25	8.75

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.85c
Gary, base	1.95c
Chicago, del.	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham, base	2.00c
St. Louis, del.	2.17c
F.o.b. cars, dock, Pacific ports	2.40c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.40c
Gary, base	2.50c
Chicago, del.	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.72c
F.o.b. cars, dock, Pacific ports	3.05c

GALVANIZED No. 24

Pittsburgh, base	3.10c
Gary, base	3.20c
Chicago, del.	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham, base	3.25c
St. Louis, del.	3.42c
San Francisco, f.o.b. cars, dock	3.70c

TIN MILL BLACK No. 28

Pittsburgh, base	2.75c
Gary, base	2.85c
St. Louis, del.	3.07c

COLD ROLLED No. 10

Pittsburgh, base	2.50c
Gary, base	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, base	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher.

Tin plate, coke base contract	$5.25
Do., stock	$4.90
Long ternes, No. 24 unassorted	3.40c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, del.	2.20c
Buffalo, del.	2.03½c
Chicago or Gary base	1.85c
Cleveland, del.	1.98½c
Birmingham, base	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific Coast, f.o.b. cars, dock	2.35c
St. Louis, del.	2.07c

Structural Shapes

Pittsburgh, base	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05¼c
Boston, del.	2.18½c
Bethlehem, base	1.90c
Chicago, base	1.85c
Cleveland, del.	1.98½c
Buffalo, base	1.90c
Gulf ports	2.20c
Birmingham, base	1.95c
Pacific Coast, f.o.b. cars, dock	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.80c
Chicago or Gary	1.85c
Duluth, base	1.95c
Birmingham, base	1.95c
Cleveland, base	1.85c
Buffalo	1.90c
Detroit, del.	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, del.	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

RAIL STEEL
To Manufacturing Trade

Pittsburgh, base	1.70c
Chicago or Gary, base	1.75c
Moline, Ill., base	1.75c
Cleveland, base	1.75c
Buffalo, base	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia, base	1.89c
Pittsburgh, refined	2.75c-7.50c

REINFORCING

New billet, cut lengths, carlots

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland (Per 100-lb. keg)

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 .15 to .25 Mo.			0.50
4600 .20 to .30 Mo. 125-1.75 Ni.			1.05
5100 .80-1.10 Cr.			0.45
5100 Cr. spring			base
6100 bars			1.20
6100 spring			0.70
Cr., Ni., Van.			1.50
Carbon van.			0.95

9250....Carbon base plus extras

Strip and Hoops

Hot strip to 23⅞-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham, base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$27.00
50-60 lbs.	$24.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pittsb., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

*All sizes, cut thrd.	70-10-10 off
*Rolled thread, ½ x 6 and smaller	70-10-10 off

MACHINE BOLTS

*All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70-10-10 off
*Tire bolts	70-10 off
Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.	
*Rolled thread machine bolts, ½ x 6 and smaller	70-10-10 off
*Step bolts	70-10 off
*Elevator bolts	70-10 off

NUTS

*S.A.E. semifinished hexagon: ½ to ⅞-inch	75-10 off
* Do., ½ to 1-inch	75 off
* Do., over 1-inch	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10 off
Do., larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.00 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. less than 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25 7½
2	41½	26

LAP WELD

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

⅛, butt weld	57½
⅛-inch, but weld	50½
¼—⅜, buttweld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½-inch, black and galv. take 4 pts.. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron; 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
5-in & over, east fdy	42.00
Do., 4-in.	45.00

Class A pipe $2 over Class B. Stnd. fitgs., Birm. base..$100.00

Semifinished Steel

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O., and Sparrows Point, Md.,	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville Fur.	$3.60- 3.85
Connellsville fdry	4.60
Connell. prem. fdy.	5.10- 5.35
New River fdry	6.00
*Wise county fdry.	4.45- 5.25
*Wise county fur.	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del	9.25
New England, Del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.19
90 per cent benzol	$0.19
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do. (100 lbs.)	0.173c

Eastern Plants, Per Pound,

†Naphthalene flakes and balls, in bbl.	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmghm.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh dist. from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50

†Off grade material is $19.50

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.25	Lake Superior fur.	21.00
Pitts. dist. fur.	18.25	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.75; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	40.00
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash.	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$19.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$15.50-16.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20%, dom. fur. spot†	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon 95.00; 1%	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper

Sheets

Yellow brass (high)	14.50
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.50
Zinc, 100-lb. base	9.50

Tubes and Pipes

High yellow brass	17.00
Seamless copper	17.25

Rods

High yellow brass	13.00
Copper, hot rolled	13.25

Anodes

Copper untrimmed	13.75

Wire

Yellow brass (high)	15.00

Old Metals

Deal, buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.37½-4.62½
Chicago	4.12-4.37½
Cleveland	4.50- 5.00
St. Louis	4.25- 4.50
Heavy Copper and Wire	
New York	5.75- 6.00
*Chicago, No. 1	5.50- 5.75
Cleveland	5.25- 5.50
St. Louis	5.25- 5.50
Composition Brass Borings	
New York	4.12½-4.37½
Light Copper	
New York	4.50- 4.75
*Chicago	4.12½-4.37½
Cleveland	4.75- 5.00
St. Louis	4.25- 4.50
Light Brass	
Chicago	2.12½-2.37½
*Cleveland	2.25- 3.00
Lead	
New York	2.87½-3.12½
*Cleveland	2.75- 3.00
Chicago	2.75- 3.00
St. Louis	2.85- 3.00
Zinc	
New York	2.00- 2.25
*Cleveland	1.75- 2.00
St. Louis	2.50- 2.75
Aluminum	
Borings, Cleveland	6.00- 7.00
*Mixed, cast, Cleve.	10.25-11.00
Mixed, cast, St. L.	9.25-10.25
Clips, soft, Cleve.	12.00-13.00

Secondary Metals

Brass ingot, 85-5-5-5	8.75
Stand. No. 12 Alum.	14.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dealers	5.00- 5.25
Buffalo, No. 1	9.50-10.50
Buffalo, No. 2	8.50- 9.00
Chicago, No. 1	8.00- 8.50
Cleveland, No. 1	8.00- 8.50
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1	7.75- 8.25
Detroit, No. 2	6.75- 7.25
Eastern Pa.	9.50- 9.75
Eastern Pa., No. 2	8.00- 8.50
Federal, Ill.	7.25- 7.50
Granite City, R. R.	7.50- 7.75
Granite City, No. 2	6.25- 6.75
N. Y., deal. R. R.	8.00
N. Y., deal. No. 2	6.50
Pittsburgh, No. 1	10.50-11.00
St. Louis	6.75- 7.00
Valleys, No. 1	10.50

COMPRESSED SHEETS

Buffalo, dealers	8.50- 9.00
Chicago, factory	7.50- 8.00
Cleveland	7.00- 7.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.00- 9.50
Pittsburgh	10.25-10.75
St. Louis	5.00- 5.50
Valleys	10.00

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.50- 7.00
Pittsburgh	8.75- 9.25
St. Louis	4.00- 4.25

SHEET CLIPPINGS, LOOSE

Chicago	4.00- 4.50
Cincinnati	4.50- 5.00
Detroit	4.50- 5.00
St. Louis	3.50- 4.00

STEEL RAILS, SHORT

Birmingham	10.00-10.50
Buffalo	12.00-12.50
Chicago (3 ft.)	9.50-10.00
Chicago (2 ft.)	10.25-10.75
Cincinnati, del.	9.75-10.25
Detroit	10.00-10.50
Pitts., open-hearth, 3 ft. and less	13.50-14.00
St. Louis, 2 ft. & less	10.00-10.50

STEEL RAILS, SCRAP

Boston	5.00- 5.25
Chicago	8.00- 8.50
Pittsburgh	10.75-11.25

STOVE PLATE

Birmingham	5.50- 6.00
Boston, dealers	3.25- 3.75
Buffalo	8.00- 8.50
Chicago, net	5.50- 6.00
Cincinnati, dealers	5.00- 5.50
Detroit, net	6.00- 6.50
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	5.00- 5.50

COUPLERS, SPRINGS

Buffalo	12.00-12.50
Chicago, springs	9.25- 9.75
Eastern Pa.	12.50-13.00
Pittsburgh	13.50-14.00
St. Louis	8.50- 9.00

ANGLE BARS—STEEL

Chicago	9.00- 9.50
St. Louis	7.75- 8.25

RAILROAD SPECIALTIES

Chicago	9.25- 9.75

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50-12.00
Cleveland, billet, bloom crops	13.00-13.50
Eastern Pa., crops	13.50-14.00
Pittsburgh, billet, bloom crops	13.50-14.00
Pittsburgh, sheet bar crops	12.50-13.00

FROGS, SWITCHES

Chicago	8.00- 8.50
St. Louis, cut	8.25- 8.75

SHOVELING STEEL

Chicago	8.00- 8.50
Federal, Ill.	6.75- 7.00
Granite City, Ill.	6.50- 7.00

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	7.50- 8.00
Buffalo, No. 2	10.00-10.50
Chicago, No. 1, net	7.00- 7.50
Chicago, No. 2	8.00- 8.50
Cincinnati, No. 2	7.00- 7.50
Eastern Pa.	9.50
N. Y., No. 1, deal.	7.00- 7.50
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	7.25- 7.50

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	8.00
New York, dealers	3.50- 3.75

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	7.00- 7.50
Cinci., No. 1, deal.	5.50- 6.00
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	6.50- 7.00
Detroit, No. 1, new	6.75- 7.25
Valleys, new No. 1	9.75

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	1.00
Buffalo	4.00- 4.50
Chicago	4.50- 5.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.00- 6.50
Detroit	4.50- 5.00
Eastern Pa.	5.00- 5.50
New York, dealers	1.75- 2.00
Pittsburgh	7.00- 7.50
St. Louis	3.00- 3.50
Valleys	7.50- 8.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.50- 7.00
Detroit	5.50- 6.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.00- 6.50

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Chicago	5.00- 5.50
Cincinnati, dealers	4.00- 4.50
Cleveland	6.75- 7.25
Detroit	5.50- 6.00
E. Pa., chemical	12.00-13.00
New York, dealers	1.50- 1.75
Pittsburgh	6.00- 6.50
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	4.00- 4.50

RAILROAD GRATE BARS

Buffalo	6.50- 7.00
Chicago, net	5.50- 6.00
Cincinnati	4.00- 4.50
Eastern Pa.	8.00- 8.50
New York, dealers	4.50- 4.75
St. Louis	4.00- 4.50

FORGE FLASHINGS

Boston, dealers	3.50
Buffalo	8.50- 9.00
Cleveland	7.00- 7.50
Detroit	6.25- 6.75

FORGE SCRAP

Boston, dealers	3.50
Chicago, heavy	9.50-10.00
Eastern Pa.	9.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	4.00- 4.50
Buffalo	7.00- 7.50
Chicago, elec. fur.	7.50- 8.00
Cleveland	6.00- 6.50
Eastern Pa.	9.00
St. Louis	6.00- 6.25

STEEL CAR AXLES

Birmingham	10.00-10.50
Boston, ship. point	9.00- 9.50
Buffalo	12.00-12.50
Chicago, net	10.00-10.50
Eastern Pa.	14.00-15.00
St. Louis	10.00-10.50

SHAFTING

Boston, ship. point	10.50-10.75
Eastern Pa.	15.00-15.50
New York, dealers	10.75-11.25
St. Louis	11.00-11.50

CAR WHEELS

Birmingham, iron	8.50- 9.00
Boston, iron deal.	5.75- 6.00
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	9.50-10.00
Chicago, rolled steel	9.50-10.00
Cincinnati, iron	7.50- 8.00
Eastern Pa., iron	11.00-11.50
Eastern Pa., steel	12.50-13.00
Pittsburgh, iron	9.75-10.25
Pittsburgh, steel	13.50-14.00
St. Louis, iron	7.25- 7.75
St. Louis, steel	8.75- 9.25

NO. 1 CAST SCRAP

Birmingham	8.50- 9.50
Boston, No. 2	6.00
Boston, tex. con.	9.00- 9.50
Buffalo, cupola	9.50-10.00
Buffalo, mach.	10.00-10.50
Chicago, agri. net	6.75- 7.25
Chicago, mach. net	8.00- 8.50
Chicago railroad net	7.25- 7.75
Cinci., mach. cup.	8.50- 9.00
Cleveland, cupola	10.75-11.25
Detroit, net	8.50- 9.00
Eastern Pa., cupola	11.00-11.50
Pittsburgh, cupola	12.00-12.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	6.50- 7.00
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	4.50- 4.75
Buffalo, break.	7.75- 8.25
Cleveland, break.	7.50- 8.00
Detroit, break.	6.50- 7.00
Detroit, auto net	9.00- 9.50
Eastern Pa.	9.50-10.00
N. Y., break. deal.	5.00- 5.50
Pittsburgh	10.00-10.50

MALLEABLE

Boston, consum.	11.25-11.50
Buffalo	10.50-11.00
Chicago, R. R.	9.00- 9.50
Cincinnati, agri. del.	7.50- 8.00
Cleveland, rail	10.75-11.25
Detroit, auto	8.50- 9.00
St. Louis, R. R.	8.25- 8.75
Eastern Pa., R. R.	11.50-12.00

RAILS FOR ROLLING

5 feet and over

Birmingham	9.50-10.00
Boston, dealers	8.00- 8.50
Buffalo	10.25-10.75
Chicago	9.50-10.00
Eastern Pa.	12.00-12.50
New York, dealer	7.50- 8.00
St. Louis	9.00- 9.50

LOCOMOTIVE TIRES

Chicago (cut)	9.00- 9.50
St. Louis, No. 1	9.50-10.00

LOW PHOS. PUNCHINGS

Buffalo	13.75-14.25
Chicago	9.50-10.00
Eastern Pa.	14.50-15.00
Pittsburgh	12.25-12.75

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper			Straits Tin		Lead			Alumi-		Nickel
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	East St. L.		Zinc St. L.	num 98-99%	Antimony Spot, N. Y.	Cath-odes
Sept. 15	9.00	9.12½	8.75	51.45	51.25	3.70	3.55	4.00	*22.90	8.75	35.00
Sept. 17	9.00	9.12½	8.75	51.45	51.25	3.70	3.55	4.00	*22.90	8.75	35.00
Sept. 18	9.00	9.12½	8.75	51.37½	51.25	3.70	3.55	4.00	*22.90	8.75	35.00
Sept. 19	9.00	9.12½	8.75	51.40	51.40	3.70	3.55	4.00	*22.90	8.75	35.00
Sept. 20	9.00	9.12½	8.75	51.55	51.55	3.70	3.55	4.00	*22.90	8.75	35.00
Sept. 21	9.00	9.12½	8.75	51.55	51.52½	3.65	3.50	4.00	*22.90	8.75	35.00

*Nominal range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORC. BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES	
Baltimore*	3.90c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES	
Baltimore*	2.90c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.00c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.93½c
Los Angeles	4.45c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Baltimore *†	4.21c
Buffalo	4.00c
Boston (g)	4.55c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.95c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.70c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS	
Baltimore	2.80c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore(c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland(h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle(f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.56c

(b) Plus straightening, cutting and quantoty differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Sept. 20

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports	£ s d	Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon	$15.00	3 0 0	$7.79	1 12 0
Basic bessemer	13.50	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	15.13	3 0 6	.....	.....
SEMIFINISHED STEEL				
Billets	$27.50	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	37.50	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$38.75	7 15 0	$26.77	5 10 0
Merchant bars	1.67c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.64c	7 7 6	.68c	3 1 6
Plates, †¼ in. or 5 mm.	1.78c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.06c	9 5 0	1.13c to 1.16c	5 2 6 to 5 5 0
Sheets, gal., 24 gage, corr.	2.51c	11 5 0	1.43c	6 10 0
Bands and strips	1.84c	8 5 0	.88c	4 0 0
Plain wire, base	2.06c	9 5 0	1.18c	5 7 6
Galvanized wire, base	2.50c	11 5 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.68c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.50	0 18 1	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.88	3 7 6	$14.03	210	$14.76	310	$25.52	63
Basic bessemer pig iron	16.88	3 7 6(a)	*12.36	185	13.57	285	28.15(b)	69.50
Furnace coke	4.38	0 17 6	8.02	120	5.24	110	7.70	19
Billets	27.50	5 10 0	28.72	430	20.94	440	39.08	96.50
Standard rails	1.84c	8 5 0	2.10c	700	2.42c	1,100	2.42c	132
Merchant bars	1.92c	8 12 0	1.68c	560	1.21c	550	2.01c	110
Structural shapes	1.95c	8 15 0	1.65c	550	1.21c	550	1.97c	107.50
Plates, †¼-in. or 5 mm.	1.88c	8 8 9	2.10c	700	1.54c	700	2.32c	127
Sheets, black	2.34c	10 10 0§	2.55c	850‡	1.71c	775‡	2.64c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.90c	13 0 0	4.50c	1,500	3.30c	1,500	6.77c	370
Plain wire	2.06c	9 5 0	3.39c	1,130	2.42c	1,100	3.17c	173
Bands and strips	2.07c	9 7 0	1.95c	650	1.54c	700	2.32c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January.

THE MARKET WEEK

Bars

Bar Prices, Page 128

Pittsburgh — Carload buying of merchant steel bars improved in number last week, although many users are still buying immediate requirements so closely that truck-load lots make up a fair share of bar shipments. A few small orders for 1935 automobiles and parts have come out and lend the alloy bar market more hope for additional specifications later in the fall. Bar prices are steady at 1.80c, base Pittsburgh, for carbon grades, and 2.45c, base Pittsburgh, for alloy.

Cleveland — The Cleveland bar mills which resumed last week, after a week's suspension, now have enough specifications to continue in operation, at least this week. While tonnage booked so far in September shows little variation from that for the same period last month, producers are gradually overcoming the gap created by the holidays, and by the end of the month expect to show a fair increase over August. Purchases for trucks and commercial vehicles picked up slightly during the week. Agricultural implement manufacturers report improved prospects for fall production.

Chicago—Despite occasional reports of increased consumption of steel bars, changes in sales and specifications are slight. Demand from manufacturers of agricultural implements and farm tractors is commencing to improve, tending to bear out predictions of increased operations in this industry during later months of the year.

Boston—Commerical steel bar buying is light with consumers' schedules light. Alloy and forging quality bars are also sluggish. Commercial steel bars are 2.20c, Boston.

New York—Commercial bar orders are more numerous but in small volume. The price is 2.13c, New York.

Philadelphia—Bar demand shows little change, with general buying light, on a hand-to-mouth basis. The Pennsylvania has released a fair tonnage over the past few days, and will open bids Sept. 26 on fourth quarter requirements. The market is steady at 1.80c, Pittsburgh, or 2.09c, Philadelphia.

Washington — Bids will be received by the bureau of supplies and accounts, navy department, Oct. 2 for 3850 pounds of grade 1 corrosion-resisting round steel bars; Oct. 5 for 17,500 pounds of grade M black medium bar steel, both flat and square sections.

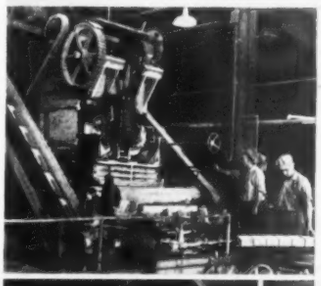
WHY ARMSTRONG'S HIGH TEMPERATURE PRODUCTS *insure successful results*

TWO things account for the uniformly high quality—the successful results—of Armstrong's high temperature products. First, the technical expertness with which they are made. And second, the careful testing which keeps them consistently up to Armstrong's rigid specifications.

They're the reasons, too, why leading furnace manufacturers and plant supervisors *standardize* on Armstrong's three Insulating Brick—Armstrong's, EF, and Nonpareil. On this page are shown a few of the steps by which Armstrong assures you of brick that are uniformly efficient.

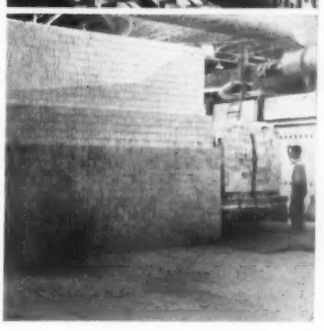
Write today for data and samples of the brick which interest you. Armstrong's EF is a light-weight, semi-refractory brick for use without fire brick protection up to 2475° F. It has proved its ability in hundreds of installations to save fuel costs and increase production volume by cutting down heating time. For temperatures up to 2500° F. behind the refractory, you'll want to consider Armstrong's Insulating Brick; for temperatures up to 1600° F., Nonpareil Brick. Armstrong Cork & Insulation Company, Insulation Division, 985 Concord Street, Lancaster, Pennsylvania.

PRECISE MANUFACTURING METHODS || **CONSTANT ACCURATE TESTING**

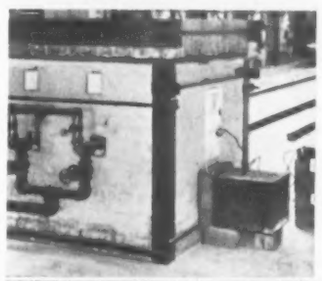


←GIANT PRESS *used for molding all types of insulating brick made by Armstrong. The accurate control mechanism assures correct pressures and press speeds. Automatic conveyors carry the brick to the dryers.*

TEST KILN, *for temperatures from 1000° to 3000° F., at Armstrong's Beaver Falls factory. Here experiments are conducted with different mixes, temperatures, and burning periods.* →



←TUNNEL KILN *specially designed for firing Armstrong's, EF, and Nonpareil Brick. Careful control of temperature is maintained by means of a recording potentiometer system and additional checking with pyrometric cones on each kiln car.*



SPALLING TEST FURNACE *used to test insulating brick under U. S. Navy specifications for spalling test. Bricks in panel forms are heated in the furnace and then cooled by air blast.* →

←SIZING *insures tight joints. Note the even setoffs in this pile of insulating brick at the Armstrong factory. The bricks as they come from the kiln are shown on the extreme right.*

HEAT FLOW TEST EQUIPMENT *in Central Technical Laboratory, Lancaster, Pa. Three simultaneous tests on high temperature brick are in progress.* INSET *— Close-up of heat flow testing equipment.* →

Armstrong's

THREE HIGH TEMPERATURE BRICK

Plates

Plate Prices, Page 128

Pittsburgh—Small tonnages of plates continue to be closed on for water tanks where federal funds are being used. The river barge market is devoid of interest and lacks the promise of private inquiries over the next 30 days.

Philadelphia—Plate volume is being sustained at the slightly improved rate of a week ago. Navy work leads with several hundred tons on which bids were recently opened still pending for various navy yards. Inquiries for steel for the cruiser to be built at the Philadelphia navy yard are expected to begin to appear within the next fortnight. New York Shipbuilding Co., Camden, N. J., has allocated hull steel for a navy cruiser to two large producers, in line with previous indications. The price situation is featured by the postponement of the effective date on the new quantity extras. These extras now will not apply on shipments until after Dec. 31. The base price is 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia.

Approximately 700 tons of plates required for water pipe fabrication is reported pending under bids to the city of Philadelphia.

Cleveland—Elyria, O., which some months ago was granted a PWA loan for a four and one-half mile water pipe line, contemplating the use of cast pipe, now is considering fabricated steel pipe, which would require 4000 tons of plates. Currently, plate demand is restricted to small, miscellaneous lots, and the Cleveland plate mill did not operate last week. Quantity extras for plates less than 6600 pounds of which were announced by mills for Oct. 1 have been postponed to Jan. 1.

Chicago—Orders for fabricated plates involve 2000 tons and include 700 tons for tanks with 675 tons placed for the Pine view dam, Utah. Inquiry from private users of plates is slow, particularly in the oil industry. Much necessary improvement and replacement work is being deferred by oil companies.

Boston—Small-lot buying of plates with a wider miscellaneous demand is noted, although the upturn has been slow. Some car lot buying has been done. Small tank builders are slightly more active, but large tank inquiry has declined. Plates are 2.20c, Boston.

New York—Demand for steel plates here is featured by oil company requirements. Standard Oil is most active with requirements for Argentine, Sumatra and other points. New York Central will open bids Sept. 28 on plate requirements for fourth quarter.

Washington—Bids will be received by the bureau of supplies and accounts, navy department, Oct. 5 for 119,300 pounds and 9650 pounds of grade M medium steel plate. Bureau of reclamation has awarded to Alco Products Co., New York, a contract for welded plate steel pipe, valves, fittings and a steel tank for the Pine View dam in Utah, at $75,530.

Contracts Placed

675 tons, penstock, Pineview dam, Utah, to Alco Products Co., New York.
625 tons, pipe line, Ponca City, Okla., to Taylor Forge & Pipe Co., Chicago.
400 tons, standpipe, Kenosha, Wis., to Graver Tank & Mfg. Corp., East Chicago, Ind.
216 tons, 500,000-gallon elevated tank, East Rochester, N. Y., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
150 tons, tank, Duquoin, Ill., to Western

THE "RAW DEAL"
has about "OUT-LIVED" its place in History
• • •
We are now "OVER-DUE" for—
A "SQUARE DEAL"
• • •
NEPOWDER - 100%:
NEP NO. 2 Liquid
SUM-FOAM - Powder - 100%
Represent
THE SQUARE DEAL
in the Steel Industry. World Wide.
• • •
You will now specify your
INHIBITOR Requirements 100% Pure
You save—75% Freight Charges
You save—20% First Cost
• • •
For 20 years we have produced the Best INHIBITOR in each year
• • •
The Wm. M. PARKIN Company
Chemical Engineers to the Steel Industry
PITTSBURGH, PA.
ACTIVE IN STEEL SINCE 1860

Gas Construction Co., Ft. Wayne, Ind.
150 tons, tank Carney's Point, N. J., to Western Gas Construction Co., Ft. Wayne, Ind.
140 tons, 400,000-gallon elevated tank, Grand Rapids, Mich., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
111 tons, 11-foot pipe, Magic dam, Magic, Idaho, to Babcock & Wilcox Co., New York.
100 tons, tank for W. H. Goodrich Co., New Haven, Conn., to Chicago Bridge & Iron Works, Chicago.
Unstated tonnage, elevated steel tank, Seymour, Wis., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

6000 tons, aqueduct, Los Angeles; bids Oct. 3.
300 tons, 700,000-gallon elevated tank, Cape May, N. J.; bids Sept. 25.
200 tons, standpipe for Vergennes, Vt.; bids close Sept. 28.
100 tons, 250,000-gallon water storage tank, Sharon Springs, N. Y.; bids in.

Sheets

Sheet Prices, Page 128

Pittsburgh—Trial sizes of sheets for some of the new 1935 automobile models continued to be placed last week. Releases from automobile makers also are fairly well sustained for 1934 models. A fair rate of specifying continues in sheet specialties, and occasionally several larger orders for black and galvanized sheets are reported.

Cleveland—Sheet mills here and in a nearby lake district serving Michigan automobile manufacturers were idle last week, but are hopeful of obtaining enough specifications to resume this week. Barrelmakers placed some fairly good orders, and a slight improvement also was noted in sales to manufacturers of household equipment.

Chicago—Sheet orders generally are light, and in the absence of active demand from the automotive industry mills are depending principally on miscellaneous users. Farm implement manufacturers show little change in their sheet requirements, and like some other users have sufficient stocks to accommodate their needs for a short time ahead. Gas range producers continue active while barrel manufacturers are fairly busy.

New York—The Argentine government is inquiring for 8000 to 15,000 tons of galvanized sheets, about 18 inches wide, of various gages, for locust prevention. Orders are light, but volume is slightly better.

Philadelphia—The sheet market displays a trifle more buoyancy, although the textile strike is holding back buying in some directions. Within the past week there has been increased demand from the coal regions of eastern Pennsylvania.

Buffalo—District sheet mills are operating at 15 to 20 per cent, but some fairly good tonnage is in sight for placement within 30 days. Production this quarter has not averaged 20 per cent, compared with the second quarter average which ranged from 60 to 80 per cent.

Washington—Bids on 13,200 pounds of flat galvanized steel and 23,550 tons pounds of flat galvanized sheet steel, bundled and crated, will be taken by the bureau of supplies and accounts, navy department, Washington, Oct. 2.

Boston—The recent slight increase in sheet specifications holds. Some improvement is noted in requirements for the building industry.

Cincinnati—A slow upward trend in spot demand for sheets continues, so that the production schedules have been increased to about 25 per cent. Mills here have not received orders

DIAMONDETTE STEEL DECKS FOR UNCLE SAM'S SAILORS

Permanence *with safety* is a "buy word" in the Navy. "A W" floor plate conforms to Government standards and specifications. Gangways, runways, landings, cross overs, floors and ladder steps on Uncle Sam's battle wagons call for a lasting, protecting covering that insures safe footing and steady sailors ready for any emergency. • Alan Wood floor plate in the safe and scientific *Diamond* and *Diamondette* patterns—in ferrous or nonferrous metals meets all requirements. • This same quality material is at *Your* service—for *any* service where protection and long life are vital considerations.

SLIP-PROOF • OIL-PROOF
HEAT-PROOF • CRACK-PROOF
SAFE • SIGHTLY
SELF-DRAINING
SPLINTERLESS

ALAN WOOD STEEL CO. ESTABLISHED 1820 TRADE "A.W." MARK CONSHOHOCKEN, PA.

108 Years' Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

Branch Offices—Philadelphia—New York—Seattle
Los Angeles—San Francisco—Houston—Boston

from automotive interests for new models.

St. Louis—Demand from consumers in this district is slow. Releases by stovemakers are in fair volume, but little has been done by car builders, and specifications from the automobile industry are disappointing.

Manufacturers Supply Co., Cleveland, which recently moved into its new warehouse at 3528 East Seventy-sixth street, has been appointed distributor for industrial products manufactured by Henry Disston & Sons Inc., Philadelphia.

Railroads

Track Material Prices, Page 129

Chicago, Milwaukee, St. Paul & Pacific is reported to have placed contract for two streamlined steam locomotives with an undisclosed interest for fast passenger service between Chicago and Minneapolis. These, with one previously ordered by the Baltimore & Ohio, are the first steam locomotives designed to match the speed of other types of streamlined trains and will be used with passenger cars built by this road in its own shops.

Illinois Central is preparing specifications for a streamlined train, action on which is expected to be taken late this year.

The Lehigh Valley is not expected to inquire for its new equipment and material for repairs for about three weeks. This involves repairs to 1500 freight cars and 400 new gondolas.

Colorado Fuel & Iron Co., Denver, is low at $30,039.69 for 400 tons of 85-pound rails in 33-foot lengths, for the Fort Peck dam land booster car track, 1200 pairs of splice bars complete with bolts, nuts and lock washers, and 125 kegs of 5½ x 9/16-inch track spikes. On an alternate bid based on 500 gross tons of relaying rails, Colorado Fuel & Iron Co. is also low at $29,588.79. Illinois Steel Co. was second low at $30,338, and $29,874.75 on the latter alternate bid basis. Bethlehem Steel Co. entered an incomplete bid with prices submitted on the 85-pound rails only.

Ramapo Ajax Corp., New York, bid $6708.89 on 100,000 pounds of split switches, frogs and guard rails for the Fort Peck dam construction railroad last week. This bid being followed by that of the Morden Frog & Crossing Works, Chicago, Wier Kilby Co., New York, and Lorain Steel Co., Johnstown, Pa.

Car Orders Placed

Bethlehem Steel Co., Bethlehem, Pa., eight air-dump cars, to Magor Car Corp., New York.

Locomotives Placed

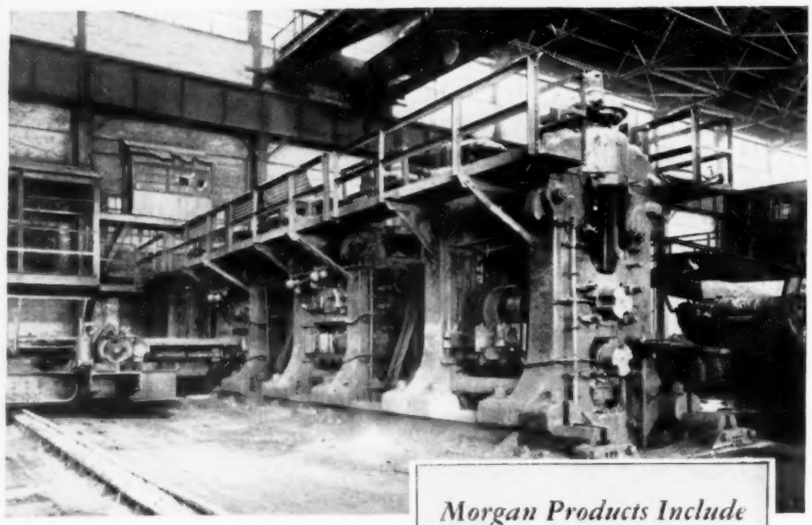
Chicago, Milwaukee, St. Paul & Pacific, two streamlined steam locomotives, reported placed with undisclosed builder.

Pipe

Pipe Prices, Page 129

Pittsburgh—Over 5000 tons of steel pipe, valves and fittings will be required in construction of the Tygarts Valley reservoir dam above Grafton, W. Va., with bids to be opened Oct. 16 in the army engineer's offices at Pittsburgh. In addition, two, 24-inch lines will provide water supply for the city of Grafton, from the dam. A large but unstated tonnage of steel pipe is required for the new Chevrolet Motor Co., assembly

BUILT BY MORGAN *Engineering* » »



HERE is a Morgan 28" Structural Mill, designed and built complete for one of the leading steel companies. Mill includes three 3-High Roll Stands and is capable of rolling structural shapes up to 24" I-beams and 8" x 8" angles. Mill is driven by a 3200 H P motor having speed regulation from 0 to 120 R P M. Equipped with worm-type screw-downs, hand-operated when installed, it is served by four electrically operated traveling tilting tables. Runout Tables, Transfer, Straighteners, Hot Beds and 52" Hot Saws were built complete with the mill itself. Morgan design-to-production responsibility is evident in every Morgan job, regardless of size, and no project is too big for Morgan engineering experience.

Morgan Products Include

BLOOMING MILLS
PLATE MILLS
CONTINUOUS MILLS
STRUCTURAL MILLS
ELECTRIC TRAVELING CRANES
CHARGING MACHINES
INGOT STRIPPING MACHINES
LADLE CRANES
SOAKING PIT CRANES
STEAM HAMMERS
STEAM HYDRAULIC FORGING PRESSES
SPECIAL MACHINERY FOR STEEL MILLS

•

DESIGNERS
MANUFACTURERS
CONTRACTORS

THE MORGAN ENGINEERING COMPANY

New York, 11 W. 42d St. ALLIANCE, OHIO *Pittsburgh, 1420 Oliver Bldg.*

plant at Baltimore, J. A. Utley, Detroit, general contractor. Oil country materials show evidence of improvement and there is cheer derived from the initial movement recently of jobbers' stocks of pipe for home rehabilitation loans.

Chicago—While little cast pipe is pending for the extensive construction program of the Chicago sanitary district, work is progressing steadily and bids are expected to be asked late in November or early December on a large tonnage. Plans have yet to be issued but several thousand tons of large sizes are expected to be involved. Most orders and inquiries elsewhere are small, with individual lots of more than 500 tons exceptional.

Boston—Inquiry for close to 1000 tons for a Vermont town, closing this week, is the feature of cast pipe demand in New England. Merchant steel pipe continues to show improvement.

New York—Cast pipe buying and inquiry are light, an exception being approximately 600 tons for Chester, N. J. A fair number of small orders are being awarded for emergency employment work. Bureau of supplies and accounts, navy department, Washington, will receive bids Sept. 28 for 920 feet of extra strong black welded steel pipe; 2150 feet of standard same; and 15,850 feet of standard galvanized same.

Inquiries are being received for approximately 6000 tons of seamless pipe for government oil fields in Argentina.

Birmingham, Ala.—Awards are disappointing, but hope has not been lost that last quarter of year will see closing of many of the contracts being held in abeyance.

Cast Pipe Placed

380 tons, 30-inch, Terminal Island outfall sewer, Los Angeles, to unnamed interest; general contract to F. W. Weber, South Gate, Calif.

217 tons, 4 to 8-inch, class 150, Eureka, Mont., to unnamed interest; general contract to Nilsen-Smith Contracting Co., Great Falls, Mont.

Cast Pipe Pending

1040 tons, 2 to 24-inch, cast iron or concrete pipe, Phoenix, Ariz.; Arizona Concrete Pipe Co., Phoenix, low on general contract.

1000 tons, 10 and 6-inch, Vergennes, Vt.; bids Sept. 28.

950 tons, 16-inch, Fox Point, suburb of Milwaukee; bids Oct. 10.

877 tons, 4 to 14-inch, class 150, Brawley, Calif.; bids in.

510 tons, 10 to 30-inch, class A, Rock Hill, N. C.; bids Sept. 27.

430 tons, San Clemente, Calif.; F. W. Weber, South Gate, Calif., low on general contract.

328 tons, 36-inch, Chicago; bids Oct. 3.

225 tons, 42-inch water main intake, Racine, Wis.

147 tons, 4 and 6-inch, class 150, Santa Monica, Calif.; bids in.

135 tons, 8-inch, Sharon Springs, N. Y.; bids in.

100 tons, 10-inch and under, Mount Vernon, N. Y.; bids in.

Revere Copper & Brass Co., New York, has opened offices in the Rhodes-Haverty building, Atlanta, Ga., to serve Alabama, Florida and Georgia. Walter W. Pitts is district manager and Michael J. Davis, Baltimore, will be in charge of the office.

Quicksilver

New York—Quicksilver prices are unchanged in a generally quiet market. Small lots are steady at $75, a virgin flask of 76 pounds, and round lots down to $74 a flask.

FROM THIS

Complete LINE

of resistance welding equipment you can select the RIGHT machine for your particular job.

Thomson-Gibb makes a *complete* line of resistance welding equipment. It includes machines for spot, seam, butt, flash or projection welding metals of every practical size, shape or material.

With this complete range of equipment available, Thomson-Gibb welding experts are able to recommend without bias the one machine best suited for your particular job. Frequently, this unlimited choice avoids the danger of makeshift equipment or expensive special machines.

To get facts and performance figures on the Thomson-Gibb machine that will help you get the greatest production at the lowest cost, fill in the coupon below and mail it attached to your letterhead.

Thomson-Gibb Electric Welding Company
163 Pleasant Street, Lynn, Mass.

Gentlemen:

☐ Please ask your nearest engineer to arrange for an appointment at our plant.

☐ Please MAIL information on the welding of

Product ..... Metal .....

Approximate dimensions .....

Desired production per hour .....

6148

THOMSON-GIBB ELECTRIC WELDING CO.

Shapes

Structural Shape Prices, Page 128

Pittsburgh — Definite assurance was given last week that inquiries will be out soon for approximately 35,000 tons of structural shapes, 5000 tons of steel sheet piling, and about 5000 tons of reinforcing steel bars, when Allegheny county was granted a federal loan of $19,000,000, and a direct grant of $5,000,000 on Sept. 17. Funds will be used to replace five bridges, construction of several tunnels, and for downtown Pittsburgh wharf improvements.

Cleveland—At least 20 inquiries are pending here from railroads, representing as many bridge repair jobs, requiring small tonnages of shapes. The largest railroad project is the construction of a car dumper at Toledo, O., for Chesapeake & Ohio, requiring 800 tons, bids on which are being taken. Among miscellaneous industrial jobs being figured by some fabricators here is 250 tons for a building for the Edwin Knowles China Co., Newell, W. Va. More figuring is being done than in some weeks including several postoffices, but total tonnage involved is relatively light.

Quantity extras on plain shapes, as announced recently to go into effect Oct. 1, have been postponed to Jan. 1. These were to apply to lots of 6600 pounds or less, for the first time in the history of the industry, and brought protests from small fabricators.

New York—Structural steel awards are light, but include a railroad bridge at Elmira, N. Y., taking 675 tons. Pending tonnage is heavier, due largely to the federal building, Vesey street, New York, closing Oct. 2, which may take as much as 17,000 tons.

Standard Oil Co. is likely to buy shortly upwards of 10,000 tons of steel, including shapes, for rebuilding its refineries in Argentina, recently damaged by fire.

August bookings of structural steel for fabrication, according to preliminary reports received by the American Institute of Steel Construction, New York, were approximately 20 per cent larger than for the preceding month, but at least 10 per cent below the average monthly bookings in the first half of this year, and 12 per cent below the bookings of August last year. August shipments were far ahead of previous months this year and larger than August last year. The tonnage available for future fabrication is still 5 per cent more than at this time last year.

Chicago—Bids on the Winona, Minn., dam are expected to be asked about Nov. 20, involving approximately 5500 tons of plates, shapes, piling and concrete bars. Bids will be taken Nov. 5 on dam No. 16 at Muscatine, Iowa. Plans for this unit have yet to be issued. Dams and bridges comprise the bulk of inquiries

LOXAL
METAL COATING

● formed by a simple, rapid, non-electrolytic
● dip of metal parts » » » » » » »

● insures freedom from rust, and provides an
● excellent bonding coat for a paint, lacquer,
● or enamel finish » » » » » » »

● enables you to apply this finishing coat at
● your manufacturing convenience » » »

CURTIN-HOWE CORPORATION
Metal Preserving Engineers
CHRYSLER BUILDING, NEW YORK, N. Y.
For further details or tests please communicate with
HANSON-VAN WINKLE-MUNNING COMPANY
EXCLUSIVE DISTRIBUTORS
MATAWAN, NEW JERSEY

Shape Awards Compared

	Tons
Week ended Sept. 22	20,028
Week ended Sept. 15	6,894
Week ended Sept. 8	7,639
This week in 1933	11,930
Weekly average, 1933	9,296
Weekly average, 1934	16,707
Weekly average, August	15,774
Total to date, 1933	542,602
Total to date, 1934	651,597

with 1200 tons for Wisconsin and 700 tons for Illinois bridges scheduled for early bids.

Boston—Structural steel lettings are heavier, with a considerable tonnage being figured for public construction, including 9000 tons for a parcel post building superstructure, Boston, closing Oct. 5.

Philadelphia—While little new work is in the immediate prospect, several hundred tons of bridge work, and 500 tons for a school have been placed in this district, and in Baltimore 5200 tons have been placed for an assembly plant for the Chevrolet Motor Co. The base price continues 1.90c, Bethlehem, Pa., or 2.00½c, Philadelphia.

Birmingham, Ala.—Fabricators of steel in this district report few orders, and keen competition from northern shops. An association of steel users has issued another statement giving figures on the differential in cost of steel as between Birmingham and Pittsburgh, and showing that the $3 per ton higher price here is playing "havoc" with southern fabricators.

Shape Contracts Placed

5200 tons, assembly plant, Chevrolet Motor Co., Baltimore, to Jones & Laughlin Steel Corp., Pittsburgh.

2850 tons, bridge over Missouri river, at Washington, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

2300 tons, bridge, Saugus river, Lynn-Revere, Mass., to McClintic-Marshall Corp., Bethlehem, Pa.

1125 tons, surgical ward operating building, City hospital, Boston, to New England Structural Steel Co., Everett, Mass.; Mathew Cummings Co., Boston, general contractor.

675 tons, grade elimination, Pennsylvania railroad, Elmira, N. Y., to American Bridge Co., Pittsburgh.

465 tons, state highway bridge, Germantown, Ill., to American Bridge Co., Pittsburgh.

425 tons, state highway bridges, Wisconsin; 225 tons to unstated interest, 200 tons to Wausau Iron Works, Wausau, Wis.

670 tons, bridge, Pennsylvania railroad, Elmira, N. Y., through Sinclair & Driggs, Philadelphia, general contractors, to American Bridge Co., Pittsburgh.

500 tons, high school, Reading, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.; 500 tons of bars to American Steel Engineering Co., Philadelphia.

460 tons, court house and custom house, Mobile, Ala., to McClintic-Marshall Corp., Bethlehem, Pa.

365 tons, Washington county hospital, Hagerstown, Md., to McClintic-Marshall Corp., Bethlehem, Pa.; J. Henry Miller Inc., Baltimore, general contractor.

340 tons, school, San Mateo, Calif., to Independent Iron Works, Oakland, Calif.

330 tons, high school, Anacostia, Washington, to Shippers' Carline Corp., Milton, Pa.

300 tons, radio station, Lualualie, T. H., to unnamed interest; Black Ltd., Honolulu, T. H., general contractor.

295 tons, addition, Robinson building, Memorial hospital, Boston, to A. O. Wilson Structural Co., Boston; John Bowen Co., Boston, general contractor.

270 tons, state highway bridge, Parkin, Utah, to Minneapolis-Moline Power & Implement Co., Minneapolis.

250 tons, building addition, department of interior, Washington, to American Steel Engineerng Co., Philadelpha.

250 tons, New York state highway bridge, RC-2343, Rensselaer county, New York, to the National Bridge Works, Long Island City, N. Y.; I. M. Ludington's Sons Inc., Rochester, N. Y., general contractor.

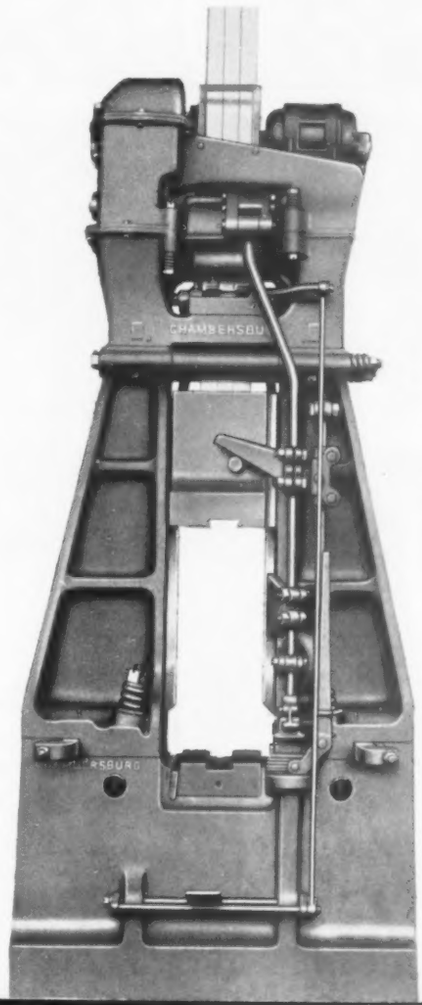
220 tons, Bedford county bridge, Bedford, Pa., to American Bridge Co., Pittsburgh; through Pitt Construction Co.

200 tons, school and convent, St. Mary's academy, Dunmore, Pa., through the Berwick Lumber & Supply Co., Berwick, Pa., to the Weatherly Structural Steel Co., Weatherly, Pa.

190 tons, factory, Servel Corp., Evansville, Ind., to International Steel & Iron Co., Evansville, Ind.

185 tons, miscellaneous structures, bureau of power and light, Los Angeles, to Western Pipe & Steel Co., Los Angeles.

175 tons, state bridge, Hocking county,



A NEW HAMMER
incorporating
CECOLLOY
the new
Chambersburg alloy

IN announcing Model J, the new Chambersburg Board Drop Hammer, we present not merely a hammer of almost unbelievable production capacity and economy, but one which incorporates the advantages of a new synthetic Nickel Molybdenum alloy, known as Cecolloy, for frames and anvil.

Model J will produce more forgings, and more accurate forgings per hour, with less down-time and part-replacement cost, and with lower power consumption than than any hammer you have ever had. Bulletin 252, just off the press, tells why. Write for your copy.

CHAMBERSBURG
MODEL J
BOARD DROP HAMMER

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

Ohio, to Burger Iron Works, Akron, O.

165 tons, state highway bridge, Sullivan county, New York, to Lackawanna Steel Construction Corp., Buffalo.

165 tons, roof, garage, Eastern Massachusetts railway, Lynn, Mass., to New England Structural Steel Co., Everett, Mass.

160 tons, state highway bridge, Middletown, Md., to Roanoke Bridge & Iron Works, Roanoke, Va.

160 tons, bridge, Kemmerer, Wyo., to Midwest Steel & Iron Works Co., Denver.

160 tons, piling at Camp Perry, O., for state, to Carnegie Steel Co., Pittsburgh.

160 tons, Pennsylvania state highway bridge, route 291, through Reed & Kuhn, Elysburg, Pa., to Lackawanna Steel Construction Corp., Buffalo.

150 tons, utility building, Yosemite national park, Yosemite, Calif., to Golden Gate Iron Works, San Francisco.

150 tons, bridge, St. Tammany parish, Louisiana, to Virginia Bridge & Iron Co., Roanoke, Va.

150 tons, grain elevator, Battle Creek, Mich., to Gage Structural Steel Co., Chicago.

145 tons, Holy Cross church, New Britain, Conn., to Berlin Construction Co., Berlin, Conn.

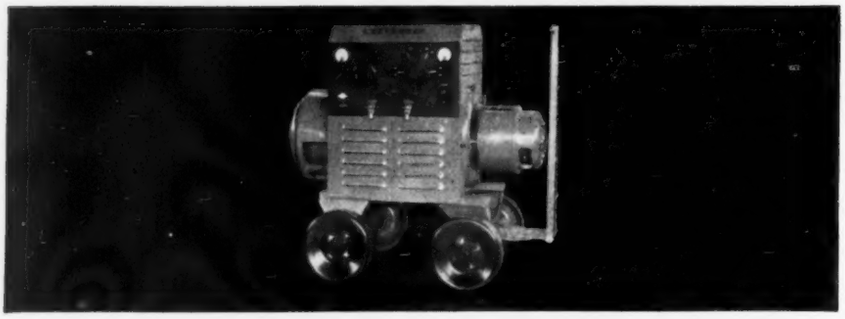
133 tons, state bridge in El Paso county, Colorado, to unnamed interest.

125 tons, building, Austin, Ind., to Central States Bridge & Structural Co., Indianapolis.

120 tons, cracking plant, Rio Grande Oil Co., Los Angeles, to unnamed interest.

105 tons, state bridge, Rush-Honeoya Falls, Monroe county, New York, to McClintic-Marshall Corp., Bethlehem, Pa.; Robert E. Tomkins, Rochester, N. Y., general contractor. Kalman Steel Corp., Bethlehem, Pa., awarded 15 tons of reinforcing bars.

ACCEPTED



for every welding job

Whether it is in the tank shop or in the oil field—in the machine shop or for maintenance, in the structural field or for plate fabrication, the UNIVERSAL ARC WELDER has gained remarkable acceptance among the largest plants in the country.

The UNIVERSAL ARC WELDER will do as much in your shop. Easy, economical operation, producing perfect welds are the qualities that have won new friends everywhere. Let us tell you about it.

UNIVERSAL ARC WELDERS
UNIVERSAL POWER CORPORATION
CLARKSTONE ROAD CLEVELAND, OHIO

Shape Contracts Pending

5000 tons, plates, shapes and piling, dam 5A, Winona, Minn.; bids to United States engineers, St. Paul, Nov. 20.

3200 tons, piling, Government Island, Calif.; bids rejected.

2200 tons for Missouri highway bridges, including: Jackson county, 1400 tons; Oregon county, 185 tons; Texas county, 100 tons; Butler county, 150 tons. Bids to be opened by Missouri highway commission, Jefferson City, Sept. 28.

1200 tons, Wisconsin highway bridges; bids Sept. 25.

800 tons, car dumper at Toledo, O., for Chesapeake & Ohio Railroad, Cleveland.

700 tons, Illinois highway bridges; bids Oct. 4.

550 tons, Minnesota highway bridges.

500 tons, high school, San Mateo, Calif.

500 tons, permanent piling, federal building, Vesey street, New York, with indefinite tonnage for temporary piling; bids being taken.

500 tons, Shurtleff school, South Boston, Mass.; bids Oct. 3.

500 tons, bridge superstructure, to carry Putnam division tracks, New York Central railroad over Saw Mill River parkway, East View station, Westchester county, New York; bids in.

450 tons, Moore Haven, lock, Lake Okechobee, Fla., for United States government.

400 tons, freight shed, Hueneme, Calif.; bids soon.

350 tons, including 90 tons of piling, Diablo dam powerhouse, Seattle light plant; Hendrickson-Alstrom Construction Co., Seattle, general contractors.

275 tons, crossing in Eagle county, Colorado, for state; bids Sept. 25.

250 tons, building for Edwin Knowles China Co., Newell, W. Va.; bids being taken.

237 tons, piling, placing only, Pine View dam, Ogden, Utah; general contract to Utah Construction Co., and Morrison-Knudsen Co.

215 tons, state highway bridge, Suwanee, N. Mex.

200 tons, building, Niagara Falls, N. Y., for Acheson Graphite Co.

200 tons, Hampton avenue viaduct, St. Louis; bids to board of public service, Oct. 9.

200 tons, powerhouse for Elmira, N. Y., reformatory.

150 tons, building, Wood River, Ill., for Shell Petroleum Co.

150 tons, Miami university dormitory, Oxford, O.; general contract to Clarence Knowlton Co., Bellefontaine, O.

129 tons, 87 tons of shapes and 42 tons of plain steel bars, Pennsylvania state highway bridge between Delaware, Montgomery and Philadelphia counties, Pennsylvania; C. W. Good, Lan-

caster, Pa., low for general contract at $104,317.45.

Unstated tonnage, dam No. 16, Muscatine, Iowa; bids Nov. 5 to United States engineers, Rock Island, Ill.

Reinforcing

Reinforcing Bar Prices, Page 129

Pittsburgh—Bids will be opened Oct. 16 at the Pittsburgh office of the war department for construction of the Tygarts valley reservoir dam near Grafton, W. Va. The project requires over 800 tons of reinforcing steel, as well as about 400 tons of structural steel, castings and gratings. Bars are being purchased for many small government postoffices.

Cleveland—New billet steel producers report they are losing considerable tonnage to makers of rail steel bars through the government specifications which permit general contractors to bid either on new or rerolled material. The latter is $3 a ton less than new steel bars, and the government is taking advantage of this. Construction work in this district is developing slowly, and few orders exceed single carloads.

Chicago—Reinforcing bar orders and new inquiries generally are small. Large tonnages are involved in pending work, however, the leading item being 18,000 tons for the Fort Peck, Mont., dam on which bids close Sept. 24. Bids on three Mississippi river dams will be taken in October and November; several hundred tons will be involved in each.

Boston—Several hundred tons of reinforcing bars have been placed in the Boston district, including 400 tons for a bridge at Revere, Mass. Small-lot buying is fairly active with inquiry holding to the recent improved volume.

New York—Reinforcing bars are more active with heavy buying of highway mesh. A substantial amount of mesh still is to be placed. Inquiry for billet steel bars also has improved.

Concrete Awards Compared

	Tons
Week ended Sept. 22	4,281
Week ended Sept. 15	2,675
Week ended Sept. 8	1,300
This week in 1933	2,112
Weekly average for 1933	3,232
Weekly average, 1934	4,742
Weekly average, August	6,854
Total to date, 1933	134,118
Total to date, 1934	184,962

Reinforcing Steel Awards

500 tons, high school, Reading, Pa., to American Steel Engineering Co., Philadelphia; 500 tons, of structurals to McClintic-Marshall Corp., Bethlehem, Pa.

500 tons, foundation and miscellaneous work, Chevrolet Motor Co., assembly plant, Baltimore, to Jones & Laughlin Steel Corp., Pittsburgh; through J. A. Utley, Detroit.

400 tons, bridge, Revere, Mass., to Kalman Steel Corp., Bethlehem, Pa.

400 tons, pier sheds Nos. 90 and 92, Hudson river, New York, to Carroll, McCready Co., Long Island City, N. Y.; through George F. Driscoll Co.

360 tons, sewer, Brooklyn, N. Y., to Igoe Bros., Newark, N. J.

329 tons, bridge over Missouri river at Washington, Mo.. Substructure, 167 tons, to Mississippi Valley Bridge & Iron Co.; 162 tons, superstructure, Stupp Bros. Bridge & Iron Co., St. Louis.

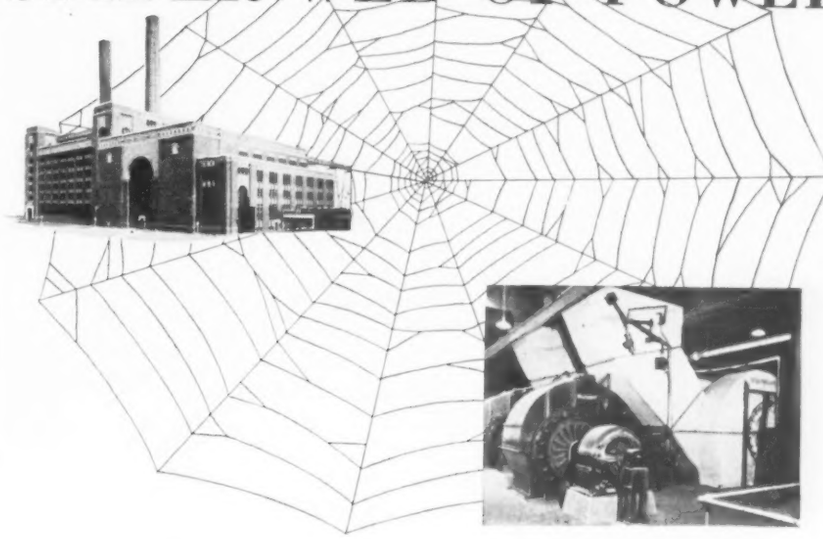
250 tons, warehouse, Frankford Grocery Co., Philadelphia, to Taylor-Davis Co., Philadelphia.

216 tons, building for Acme Steel Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

210 tons, radio station, Lualualie, T. H.,

In Chicago's

SPIDER WEB OF POWER



STURTEVANT FANS SERVE

the largest turbo-generating unit of all

At the renowned State Line Station . . . serving the Metropolitan District of Chicago, and now operating one generating unit of 208,000 kilowatts capacity,—the largest ever built . . . 24 Sturtevant Draft Fans are used. They serve Unit No. 1 . . . one of the five units which eventually will be put in operation.

All of the Sturtevant Fans have their volume and pressure controlled by movable vanes built into the fan inlets. 12 of the fans are for forced draft, each of 60,000 C. F. M. capacity. The other 12 are for induced draft, each of 220,000 C. F. M. capacity. Total capacity of all fans:—2,040,000 C. F. M. Total motor horsepower requirements:—5700 H. P.

Sturtevant Fans of the same type have been selected for units No. 2 and No. 3 because of the record of reliable and tested performance with Unit No. 1.

Illustrations show State Line Station of the Chicago District Electric Generating Corp. Engineers:—Sargent and Lundy, Inc.

B. F. STURTEVANT COMPANY

Main Offices: Hyde Park, Boston, Mass., Chicago, Ill., 400 North Michigan Avenue, San Francisco, Cal., 681 Market Street.

Branch Offices in Other Cities

Sturtevant

DRAFT FANS

to unnamed interests; E. E. Black Ltd., Honolulu, T. H., general contractor.

200 tons, Illinois state road work, to Materials Service Corp., Chicago.

160 tons, mesh, highway, Jefferson county, New York, to American Steel & Wire Co., New York; through Whitmore, Rauber & Vicinus, Rochester, N. Y.

155 tons, hospital building, Waverly, Mass., to Concrete Steel Co., Boston.

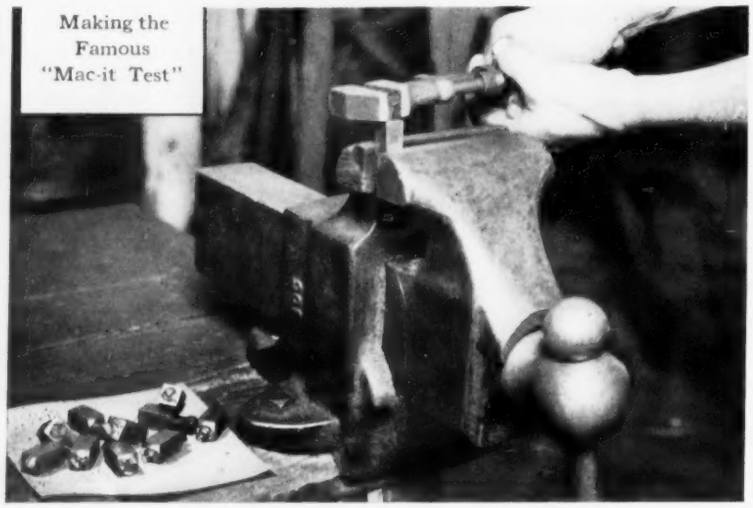
141 tons, two state bridges in Los Angeles county, California, to unnamed interest.

125 tons, mesh, highway, Cattaragus and Erie counties, New York, to American Steel & Wire Co., New York; through Holmes & Murphy, Orchard Park, N. Y.

125 tons, mesh, highway, Schenectady county, New York, to American Steel & Wire Co., New York; through Davis & Sterns Inc., Whitney Point, N. Y.

110 tons, viaduct, West 205th street, Bronx, New York, to Truscon Steel Co., Youngstown, O.; through J. Leopold & Co.

100 tons, mesh, highway, Tioga county, New York, to Wickwire Spencer Steel Co., New York; through Tyne & Willey Inc., Binghamton, N. Y.



MAC-IT ALLOY STEEL SET SCREWS
THE STRONGEST SET SCREWS MADE

Prove it yourself

Send for a free Mac-it test set. Make the test as shown above. Pull until the end of the steel block is pushed out. Then examine the screw. Not the slightest injury. The screw remains as perfect as before. No breakage, no stripping of threads, no mushrooming of point.

Working conditions can't be too severe for Mac-its.

The Strong, Carlisle & Hammond Co.
1393 West Third Street
Cleveland, Ohio

Reinforcing Steel Pending

1000 tons, Hampton avenue viaduct, St. Louis; bids Oct. 9 to board of public service, St. Louis.

1000 tons, department of parks, New York; bids Sept. 26.

850 tons, Hart's island piers for Triboro bridge, New York; bids Oct. 4.

800 tons, Tygarts valley reservoir dam, near Grafton, W. Va.; bids to Pittsburgh army engineers, Oct. 16, including approximately 400 tons of miscellaneous structural steel, as well as castings.

400 tons, Kensington high school, Buffalo.

400 to 500 tons, George Washington high school, San Francisco; bids Sept. 26.

325 tons, California Fruit Growers Exchange building, Los Angeles; bids soon.

310 tons, for powerhouse and other projects Diablo dam, Seattle light plant; city to take bids soon.

200 tons, addition, state school, Elmira, N. Y.

178 tons, state bridges in Pueblo and Eagle county, Colorado; bids Sept. 25. Eagle counties, Colorado; bids Sept. 25.

Strip Steel

Strip Prices, Page 129

Pittsburgh—A reduction of $5 a ton in cold-rolled strip steel to 2.35c, Pittsburgh or Cleveland, was seriously threatened last week by a Detroit producer. This follows upon intimations of such a reduction for several months. However, although the price reduction was filed, its release was withheld, therefore, the net effect being that the cold strip market is unchanged at 2.60c, Cleveland or Pittsburgh. In hot-rolled strip steel, the market is steady and unchanged at 1.85c, Pittsburgh.

Cleveland—Tonnage summed up in small, miscellaneous orders has improved slightly, and mills in this district operated part-time last week after a week's suspension. Orders from the automobile industry are limited to fill-in requirements for completion of present models. Producers continue to quote 2.60c, base, Cleveland, for cold rolled, equivalent to 2.80c, delivered, Detroit. A Detroit producer filed a base price of 2.35c, but withdrew it before it became effective.

Chicago—Strip demand continues light, still being influenced by quiet demand from the automotive industry. Forward buying of both hot and cold-rolled strip is deferred.

Boston—Strip is slightly more active, notably cold-rolled specialties with some of the smaller shops. Little new buying has been done on hot-rolled.

New York—Steel strip demand is dull, and prices are unchanged.

Wire

Wire Prices, Page 129

Pittsburgh—Carload buying of wire products was a little more frequent last week. The federal reforestation program in the drouth-stricken Middle West contemplates the use of 160,000 tons of wire, and 55,000,000 fence posts which would require 192,500 tons if made of steel, but the date for taking bids is indefinite. The market remains officially quoted $2.60 per keg, Pittsburgh, for standard wire nails; 2.30c, for plain wire; and $63.00 per base column for woven wire fencing.

Cleveland—Tonnage booked so far this month for wire and nails is slightly heavier than in the comparable period in August, though orders still are restricted to single carloads or less. Little improvement has developed from bolt manufacturers.

Chicago—Betterment in steel wire demand is irregular and small. Manufacturers' wire is moving moderately better than a month ago, some of this pickup being ascribed to effects of changes in extras effective next month.

Boston—Improvement in wire demand is slow, although some spotty gains are noted on the part of jobbers and consumers who did not overstock in the recent wave of buying.

Philadelphia—Nail tonnage is moving better, reflecting seasonal repairs to buildings. Manufacturing lines of wire, however, show little gain.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 129

Following sharp concessions in nut and bolt prices recently, leading manufacturers have reduced their quotations for the remainder of the year, amounting to about 20 per cent.

Carriage and machine bolts now are quoted 70-10-10 off list by producers, compared with a discount of 70 off list formerly. The revised discount applies f.o.b. all basing points with charges at equalization points unchanged.

Corrugated-carriage, step, stud, anchor, track and elevator bolts are now under the same classification, all taking a similar 70-10 discount. Formerly some of these types of bolts had taken 66 off, others 60 off.

Instead of a single price on semi-finished nuts, formerly 70 off, there are now three divisions: ¼ to 7/16-inch which are 75-10 off; ½ to 1-inch, 75 off; and 1 inch and over, 70 off.

Stove bolt prices have not been reduced, and no change has been made in cap and head screws.

Large structural rivets remain 2.90c, Pittsburgh or Cleveland, and 3.00c, Chicago, and small rivets 70-5 off.

Cold Finished

Cold Finished Prices, Page 129

Pittsburgh—Moderate gains continue in cold-finished steel bar buying. Cold-drawn carbon bars hold at the 2.10c, Pittsburgh base, with the following equalization charges prevailing unchanged: Gary, Ind., and Cleveland, 2.15c; Buffalo, 2.20c; Detroit, 2.30c and Eastern Michigan, 2.35c.

Tin Plate

Tin Plate Prices, Page 128

Pittsburgh—A steady flow of domestic and export orders for tin plate continues to come to producers

AUTOMOTIVE EQUIPMENT
AGRICULTURAL MACHINERY
SCREW MACHINE PRODUCTS
ELECTRICAL EQUIPMENT
DOMESTIC APPLIANCES
PRINTING MACHINERY
SPECIAL MACHINE PARTS
TEXTILE MACHINERY
MECHANICAL OFFICE APPLIANCES
ELEVATING CONVEYING & TRANSMISSION EQUIPMENT

WYCKOFF STEELS
to meet specific industrial requirements

Whether your requirements are standard or whether your job demands a steel of special metallurgical charactertistics involving exceptional toughness—unusually high tensile strength or extraordinary hardness, you can get it at **WYCKOFF**—Industry's Metallurgical Guide to Cold Drawn Steels of every description, size and shape.

WYCKOFF DRAWN STEEL COMPANY
GENERAL OFFICES:
First National Bank Bldg., Pittsburgh, Pa
MILLS at Ambridge, Pa. and Chicago, Ill.

Manufacturers of
COLD DRAWN STEELS
Turned and Polished Shafting, Turned and Ground Shafting

who had anticipated a falling off in operations at this time. The operating rate holds 45 per cent for the industry. The market is steady at $5.25, per base box, with tin mill sizes of black sheets, 2.75c, Pittsburgh.

Iron Ore

Iron Ore Prices, Page 130

Cleveland — Unless iron and steel production shows a marked gain in October and November it is probable iron ore shipments this season will not be much more than last year. August registered the third consecutive monthly reduction in consumption.

Shipments from upper lake ports so far in September indicate a 3,500,000-ton month, bringing the total for the season to 19,000,000 tons. Some authorities expect only 3,000,000 tons over the remainder of the year. Last year's total iron ore movement was 21,600,000 tons.

The number of vessels in the trade Sept. 15 was 115 or 19 less than on Aug. 15, and 84 less than on Sept. 15, 1933.

The Lake Superior Iron Ore association reports the following on consumption and stocks:

	Tons
Consumed in July	1,599,865
Consumed in August	1,443,943
Decrease in August	155,922
Consumed in August 1933	2,611,903
At furnaces Sept. 1, 1934	27,857,633
On Lake Erie docks Sept. 1, 1934	4,855,814
Total at furnaces and Lake Erie docks Sept. 1, 1934	32,713,447
Total Sept. 1, 1934	30,155,875

AUCTION — SAMUEL T. FREEMAN & CO. — PHILA. & BOSTON

Master's Sale at Auction

U. S. Dist. Court, East. Dist. Pa. Fidelity Philadelphia Trust Co. vs. Hale & Kilburn Corp'n. et al, March Sessions, 1931. No. 6553. In Equity.

Modern Manufacturing Realty

Raw Material, Machinery, Equipment of

HALE & KILBURN COMPANY

Mfrs. of Railway Car and Motor Bus Seats, Metal Doors and Steel Partitions

Lehigh Ave. and 18th Street, Philadelphia, Pa.

OCTOBER 9, 10, 11, 1934

AT 10 A. M. EACH DAY ON THE PREMISES

REAL ESTATE—More than 3 acres of ground with 4 street frontages and railroad frontage, improved with a group of modern manufacturing buildings, containing 488,600 sq. ft. floor area. Also a small unimproved parcel to be sold separately.

Raw Material, Machinery, Equipment

To Be Sold in Separate Lots Only

MACHINE TOOLS
TINSMITHS' TOOLS
ELECTRICAL EQUIPMENT
WOODWORKING MACHINERY
POWER PLANT EQUIPMENT
PLATE STAMPING & PUNCHING MACHINERY
UPHOLSTERING MACHINERY
STOCK OF SHEET STEEL
FACTORY EQUIPMENT
OFFICE FURNITURE

2781 Separate Lots

Write for Descriptive Illustrated Catalog

SAMUEL T. FREEMAN & CO., *Auctioneers*

27 William St. NEW YORK — 1808-10 Chestnut St. PHILADELPHIA — 80 Federal St. BOSTON

Pig Iron

Pig Iron Prices, Page 130

Pittsburgh—Practically no fourth-quarter contracts have been signed by district foundries and their pig iron purchasing continues on a hand-to-mouth basis, with most orders being of less than carload lot sizes. The market is quoted steady at $18.50 in this district for foundry grades, $18.00 for basic, and $19.00 for bessemer. The steadily declining scrap market has made heavy inroads into the normal pig iron melting by foundries.

Cleveland—Producers now estimate merchant pig iron shipments this month will exceed those of August, low of the year, by about 20 per cent. Malleable foundries are more active on automobile work. Demand in general, however, is not showing the usual seasonal increase.

Corrigan, McKinney Steel Co. last week sent to the American Iron and Steel institute a base price of $16.25, Cleveland, a reduction of $2.25 from the going market on foundry and malleable iron. The notice, however, was subsequently withdrawn, and the market continues $18.50. The code prohibits an increase in price during a quarter, once a sale has been made. It was reported, though unverified, that a large automobile interest was negotiating for 40,000 tons of iron.

Boston—Pig iron buying still is listless, generally for small lots with imported and southern iron figuring largely in the volume. Foundry melt has gained but little and in some instances is lower. A large Springfield, Mass., foundry is down.

Chicago—While pig iron shipments are 10 to 11 per cent heavier than in August, deliveries and new business continue in small volume. Lots of 50 and 100 tons predominate orders, these coming principally from small

foundries. Larger consumers generally are protected by stocks until well into fourth quarter. Foundry operations are slow to increase, due in part to continued light output by automotive plants.

Philadelphia—Although a shade better in volume, buying continues spotty with orders confined to small lots. Consumers' stocks are becoming increasingly depleted in the case of the average small foundry, with a result that sellers look for further improvement in orders. Bids will be received Sept. 28 by the bureau of supplies and accounts, navy department, Washington, for 90 tons of special grade foundry pig iron for the Norfolk navy yard.

Buffalo—Some increases in foundry melt of iron were reported this week although buying continued at a slow pace and shipments on old orders continued to lag. A substantial portion of some third quarter contracts remains to be delivered and probably will be rewritten.

Cincinnati—Pig iron sales continue restricted to carload lots.

St. Louis—Conditions in the pig iron market continue quiet, the only hopeful factor developing in the past week or ten days being a moderate increase in the melt. Requirements of the principal consumers of steel and iron, including railroads, automobiles and building, have failed to expand, mills and foundries relying mainly on miscellaneous business for current operations. St. Louis Gas & Coke Corp. has announced that present iron prices will prevail through the fourth quarter, and southern makers have also extended present quotations until Dec. 31.

Birmingham, Ala.—Single-car orders for pig iron are less numerous and inventories on yards of melters are almost negligible. Production is lower now than in more than 15 months, and further report is heard that another furnace or two may be taken out of commission before the end of the month or shortly thereafter.

Toronto, Ont.—Demand for merchant pig iron during the past week held to a level comparable with that of the previous few weeks. While local blast furnace representatives predict improvement for the fall, there has been no definite development in this respect.

Semifinished

Semifinished Prices, Page 129

Semifinished steel demand is made up chiefly of material for tin plate rollers, while billet, wire rod and skelp orders are inconsequential. Prices quoted at Pittsburgh are $27 for billets; $28 for sheet bars; $38 for wire rods, and $34 for skelp. Considerable uncertainty as to the outlook for prices is noted among producers.

Metallurgical Coke

Coke Prices, Page 129

Shipments of coke are in small volume. Beehive coke is $5.10 to $5.35 per ton, Connellsville ovens, for premium brands, and $4.60 for common grades. Most furnace coke users are not availing themselves of the $3.60 price for contracts and pay $3.85 for spot shipment on the small lots they need.

Pittsburgh consumers are not taking as much as recently. At Chicago movement is somewhat smaller than in August. Prices continue $8.50, ovens, for outside delivery, and $9.25, delivered Chicago. St. Louis consumers show no tendency to stock for

This Can't Slip Behind — When This Turns

There is no loss in production due to gradual slowing down of the driven machine through slippage.

Even on loads that vary—where speeds accelerate and decelerate—and where starts are frequent—your driven member rotates at the definite speed ratio selected where Diamond Roller Chain Drives are used.

Diamond Roller Chain motor drives also serve under conditions that would be unfavorable for many types of drives—they are unaffected by weather, moisture, fumes, etc.

If our 96-page Catalog 583 is not in your possession—let us mail you a copy.

DIAMOND CHAIN & MFG. CO.
455 Kentucky Ave. Indianapolis, Ind.
Offices and Distributors in All Principal Cities

DIAMOND CHAIN
ROLLING ~ AT POINTS OF CONTACT

winter and are buying only for immediate needs. At Cincinnati coke buying is close to the August rate, at unchanged prices. Independent producers at Birmingham, Ala., are making fairly good shipments but steel works ovens are operating at a low rate.

Scrap

Scrap Prices, Page 130

Pittsburgh—This week a district independent mill, starting three open-hearth furnaces for the first time since last July, will provide some scrap outlet in the district. Lifting of this shipping suspension follows closely upon that of a down-river independent which has been actively releasing all old orders. However, fresh participation in the market is noticeably lacking among steel mills here, despite the fact that open hearth melting operations have improved for two consecutive weeks. A district plant of a leading interest one day last week took in over 20 carloads of hydraulic bundles on a direct movement. Inasmuch as the lowest at which heavy melting steel has been sold in this district is around $10.25 per ton, the consumers' buying market holds steady at $10.50 to $11.00.

Cleveland—Shipments of steel and iron scrap are small and buying is practically absent. Some lowering of prices has resulted from similar action in other centers, most quotations here being nominal.

Chicago—A sale of No. 1 heavy melting steel at $8.50 reduces the market on this grade another 25 cents here, the third reduction of this amount in September. Demand continues quiet and there is little urgency on the part of consumers to buy or on the part of dealers to sell. Demand from foundries generally is light although some farm implement companies recently have been taking moderately larger lots. Prices on most other scrap grades reflect weakness in heavy melting steel, with quotations off 25 to 50 cents a ton.

Boston—Buying of heavy melting steel for export is resuming. Several thousand tons have been placed for boat shipment. Domestic buying is light. The Worcester, Mass., consumer is taking car lots in a limited way at unchanged prices.

New York—Domestic buying of scrap continues sluggish, but export demand is steady at unchanged prices, $8 for No. 1 heavy melting steel, barge, and $6.50 for No. 2. Export prices on heavy melting steel grades is approximately $1.50 a ton higher than what dealers will pay for domestic shipment f.o.b. cars.

Philadelphia — Domestic scrap prices remain unchanged although the tone is easier. In the export market, $9.25, dock, on No. 1 steel has virtually disappeared, with $8.75 the top. This latter price has been applying recently on new business for foreign shipment, with the former until lately applying on material against orders. Domestic purchases include a few hundred tons of No. 2 steel for Coatesville, Pa., at $8, delivered.

Buffalo—Demand for scrap has broadened although sales still are restricted to small lots and are generally for foundry melt. Prices generally have been near the top of recently quoted ranges, dealers claim.

Detroit—Despite small lists offered by automobile plants, some weakness is inherent in the market through the continued absence of consumers. No. 1 heavy melting steel here remains $7.75 to $8.25, and a stronger tone is evident in blast furnace borings and turnings at $5.50 to $6.00.

Cincinnati—Several grades of iron and steel scrap are quotably lower in a market which has revealed additional weakness by lower bids on railroad lists.

St. Louis—Buying of steel and iron scrap is confined to small lots for immediate delivery. Steel mills are operating at a low rate and have sufficient stocks for their needs. Except for a few adjustments prices are unchanged and nominal.

Birmingham, Ala.—Steel and iron scrap is quiet, heavy melting steel melters taking little tonnage. Railroad offerings are absent. Prices are weak.

Toronto, Ont.—Trading in iron and steel scrap is dull with demand confined to special grades for spot delivery. Steel scrap is moving slowly with little interest reported from the Hamilton mills and shipments of heavy melting steel and turnings have dropped sharply.

CROSBY STAMPINGS

Since 1896 the Crosby plant has been devoted, exclusively, to designing and producing Sheet Metal Stampings. Avail yourself of this experience. Send us your next stamping problem and watch results.

Manufacturers *IDEAL TROLLEY WHEELS*

THE CROSBY COMPANY
BUFFALO, N. Y.

Branch Offices: **New York, Philadelphia, Pittsburgh, Cleveland, Detroit, Chicago.**

Coke By-Products

Coke By-Product Prices, Page 129

New York—Low output of distillates has a steadying influence on prices, although demand is smaller than several weeks ago. Shipments of naphthalene and sulphate of ammonia against contracts are slightly heavier. Phenol is unchanged with a fair demand.

Warehouse

Warehouse Prices, Page 132

Pittsburgh—Warehouses here reduced prices on bolts and nuts, effective Sept. 17. Machine and carriage bolts now are 70 off for broken lots and 70-10 off for case or keg lots. Track, stud, step and elevator bolts are quoted 65 off for broken lots and 70 off in case or keg lots. Other steel warehouse prices here are steady. Little change has occurred in the volume of warehouse steel buying.

Cleveland — Warehouse business continues to shrink, and for the month to date is 10 to 25 per cent less than in the comparable days last month. Sellers are readjusting prices to conform with the reductions announced by nut and bolt manufacturers.

Chicago—Business has improved moderately since the middle of the month. A reduction in bolt and nut prices is expected to be made shortly in keeping with the change in mill quotations.

New York—Little improvement has developed in demand for steel out of warehouse. Orders are generally for small lots and well spread, with prices unchanged.

Detroit—A slight improvement in warehouse steel demand continues in this district. There is some fair buying for new plant conveyor systems and general industrial rehabilitation work. Prices are steady.

Cincinnati — Warehouse business fails to show much seasonal improvement, individual orders being light and close to the August demand in volume.

St. Louis—Sales of iron and steel from store this month show little change from August. Stocks are generally of fair size, with assortments complete. Buying by railroad shops continues in good volume.

Steel in Europe

Foreign Steel Prices, Page 132

London—*(By Radio)*—Great Britain's foreign trade in iron and steel products fell off in August. Exports at 193,412 tons were 3688 tons less than in July. Imports at 102,165 tons were 24,235 tons less than in July.

Markets are fairly active. Pig iron prices are tending upward. Light foundries are busy and steelworks are well employed. The sheet trade is expanding slightly, with exports of galvanized sheets slightly better, and tin plate mills fairly well booked.

The Continent reports some export activities, especially in merchant steel. Japan, China, the Argentine and Brazil offer the best markets.

Nonferrous Metals

Nonferrous Metal Prices, Page 130, 131

New York—Dullness continued in nonferrous metals. Prices were steady but on Friday lead declined $1 a ton to a basis of 3.50c, East St. Louis.

Copper—September sales have totaled barely 3500 tons. Trading during the week was quiet with prices holding unchanged on the basis of 9.00c, Connecticut, for blue eagle.

Lead—American Smelting & Refining reduced its price on Friday to 3.70c, New York, and this cut was followed by St. Joseph Lead with a price of 3.50c, East St. Louis.

Zinc—Only light sales were made

LINING FOR PICKLING TANKS

CEILCOTE will acid-proof and leak-proof your tanks whether they are of wood, stone, steel, concrete or brick construction. All new tanks should be lined with CEILCOTE and the old are renewed for years of additional service.

CEILCOTE is not affected by any of the acid solutions, even though held constantly at boiling temperature.

Wood or brick sheathing is used over CEILCOTE to prevent mechanical damage. Complete specifications and blue prints are furnished.

CEILCOTE is in use by leading steel plants and allied industries in this country, Canada and Europe. Upon request, we will refer you to Users nationally known.

Permit us to prove to you that CEILCOTE is the most economical, dependable and lasting tank lining known. The enormous saving in acids, inhibitors and tank equipment will pay for the use of CEILCOTE a hundred fold.

Ceilcote is patented in U. S. Patent Office and also foreign countries

THE CEILCOTE COMPANY

Rockefeller Building — Cleveland, Ohio

"DARWIN"

QUALITY

The ultimate in the evolution of

TOOL STEELS

Non-Deforming, Oil-Hardening "NEOR"

Air-Hardening—Patent Cobaltcrom "PRK-33"

which can also be used in the form of

CASTINGS

DARWIN & MILNER, INC.

1260 West 4th Street, CLEVELAND, OHIO

with prices holding unchanged on the basis of 4.00c, East St. Louis.

Tin—Futures were selling again at a discount under spot Straits Friday after selling on a par with spot for several days. Toward the end of the week spot was quoted 51.55c, and futures 51.50c.

Aluminum—Little interest was shown and prices were unchanged.

Antimony—Trading was quiet during the week with spot and futures holding unchanged at 8.75c to 9.00c, duty paid, and 7.10c to 7.20c c.i.f. for futures.

Pacific Coast

Pacific Coast Prices, Page 129, 130, 132

San Francisco—*(By Air Mail)*—Featuring the market this week was the award of the general contract for construction of the Pine View dam, seven miles north of Ogden, Utah, to Utah Construction Co., Odgen, Utah, and Morrison-Knudsen Co., Boise, Idaho, on a joint bid of $677,898.

Unnamed interests booked 210 tons of reinforcing bars for a radio station at Lualualie, T. H., and 141 tons for two state bridges in Los Angeles county. Bids open Sept. 26 for 500 tons for the George Washington high school, San Francisco, and Sept. 25 for 178 tons for bridges in Colorado.

The only plate award of size went to Babcock & Wilcox Co., New York, for 111 tons for a pipe line for Magic dam, Magic, Idaho. The Los Angeles aqueduct, up for figures Oct. 3, will require 6000 tons.

Unnamed interests took 380 tons of cast iron pipe for an outfall sewer in Los Angeles and 217 tons for Eureka, Mont.

Public Work Main Reliance

Seattle—Public works projects still are the mainstay of iron and steel plants in the Pacific Northwest, industrial buying being confined to bare necessities.

Hendrickson-Alstrom Construction Co., Seattle, was low bidder and received the contract at $267,298 for Seattle's Diablo dam powerhouse, transformer and switch platform, tail race and other construction. The project involves 260 tons of shapes, 90 tons of steel sheet piling, and 310 tons of reinforcing bars, the latter to be bought by the city. The same department Oct. 11 will receive bids for $200,000 worth of equipment.

Equipment

New York—Inquiry for machine tools is slightly heavier with several orders placed by holders of contracts for navy equipment. Most interest is shown in metalworking tools. Prices have advanced on some lines of standard equipment with a stronger tone aparent in others.

Washington—It is expected that specifications will be sent out shortly by the army ordnance department for a large list of machine tools in connection with the grant of $2,300,000 which has been made to the army by PWA for the purchase of these tools. This grant has been under discusison for a long time; the money was allocated by Secretary Ickes, but several things intervened which seemed likely to hold up the grant. However, it is understood on good authority now, that the actual money has been paid to the army for this purpose. It is expected that bids will be opened for these machine tools within the next six weeks or so although the date has not yet been set.

ABC's of B.t.u.'s

So *intimate* is the mixture of fuel and air when discharged from BUCYRUS BURNERS that each B. t. u. is made available for combustion.

Why buy fuel on specification and lose its full heating value with inefficient equipment.

Refinements in BUCYRUS OIL & GAS BURNERS insure better atomizing and mixing, easier control and more stable operation.

TRIPLE ATOMIZING OIL BUCYRUS BURNERS GAS TRIPLE MIXING

MAY WE SEND FULL PARTICULARS?

● *Shunk Manufacturing Co.—in business since 1854—has a very definite reputation for high quality products. You can rely on BUCYRUS BURNERS being built accurately to high standards.*

Burner Division

SHUNK MANUFACTURING COMPANY

Auto Ave.

BUCYRUS, OHIO

Installations in many of the nation's largest plants have proved that Vapofier gas is definitely better than natural or manufactured gases for all steel treating work—and frequently costs from 50 to 70% less.

VAPOFIER

TRADE MARK REG. U.S. PAT. OFFICE

Gas Generating Unit

We invite you to visit our booth, number 258, at the New York Show, or write us for our new booklet giving proof of results.

VAPOFIER CORPORATION, 2807 S. Michigan Avenue, Chicago, Ill.

Branches at: Newark, N. J. Springfield, Mass. Detroit, Mich. Milwaukee, Wis. Indianapolis, Ind. Rock Island, Ill.

Construction and Enterprise

New York

CANASTOTA, N. Y.—A company has been organized by A. M. Loungway and associates to produce tools, dies and bearings in the plant formerly occupied by the Ideal Cut Glass Co., Canastota.

GENEVA, N. Y.—Summit Foundry Co., in receivership for the past two years, has been reorganized and operations were resumed Sept. 17. L. F. Millington, Syracuse, N. Y., is general manager for the syndicate which has assumed operation of the foundry.

HERKIMER, N. Y.—Airite Corp has been formed to manufacture air conditioning and cooling equipment by D. H. Ames Jr., 402 French road, Utica, N. Y., and associates.

MASPETH, L. I., N. Y.—Vulcan Rail & Construction Co., Morrison and Grand avenues, ornamental iron, will build a 2-story addition 24 x 110 feet, after plans by J. R. O'Donnell, architect.

Pennsylvania

PHILADELPHIA—Real estate, raw materials, machinery and equipment of the Hale & Kilburn Co., manufacturer of railway car and motorbus seats, metal doors and steel office partitions, Lehigh avenue and Eighteenth street, Philadelphia, will be sold at master's sale at auction Oct. 9-11. Samuel T. Freeman & Co., auctioneers, are in charge. Included are plate stamping and punching machines, power plant, tinsmith tools, machine tools, woodworking machinery, stock of steel and small tools.

Ohio

CLEVELAND—Green's Heat Control Inc., care of Carl M. Babst, 582 Arcade building, has been formed to manufacture heating control equipment.

MANSFIELD, O.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will build a new factory unit and install equipment at its electric refrigerator plant here, to cost about $175,000.

Michigan

DETROIT—McClanahan Oil Co. of Michigan, Walter L. McClanahan, president, recently organized, is planning to erect an oil refinery in central Michigan as an outlet for the crude oil production of the McClanahan Oil Co. The plant is expected to take from 1000 to 1500 barrels of crude oil daily. William H. Hoehn, 2 Buhl building, Detroit, is director.

NEWBURG, MICH.—Ford Motor Co., Dearborn, Mich., is planning to build a plant here, 98 x 122 feet, to be equipped for both water and steam power. The plant will be erected on the north side of the new dam at Newburg lake on the Newburg road.

ST. JOSEPH, MICH.—Upton Machine Co. will build 1-story addition to cost about $40,000.

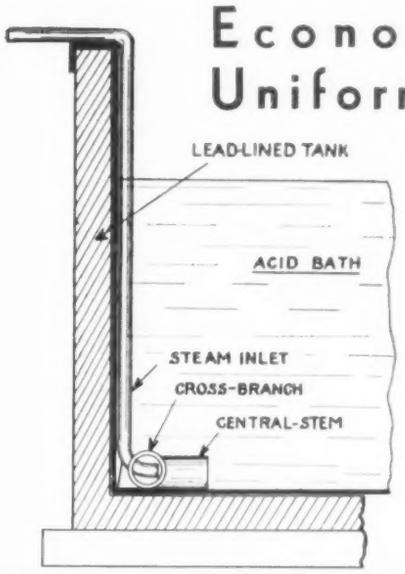
Indiana

NORTH VERNON, IND.—City, W. H. Stemm, mayor, is revising plans for a sewage disposal plant on which former bids were rejected. C. Hurd, 1039 Architects building, Indianapolis, is engineer.

PERU, IND.—Central States Factories Inc. has been formed to engage in a general manufacturing business in iron and wood., by Claude Dewalt, resident agent; Holt Pilkington and Albert N. Speyer.

WARSAW, IND.—Winona Refrigerator Car Corp., Center and Indiana streets, Warsaw, Ind., has been formed to manufacture refrigerator cars, by Charles D. Knoefel, H. Anton Hartman, Walter A. Gadient, Theodore C. Frazier, who is resident agent, and George Boone.

CHICAGO—Better Traffic Signs Inc., 1059 East Seventy-sixth street, has been incorporated to manufacture signs, sig-



Economy and more Uniform Heating for Pickling Baths-

is obtained by this new steam injector. The new fitting comprises a heavy walled T-shaped body of lead which lies flat and firmly on the bottom of the tank—see sketch.

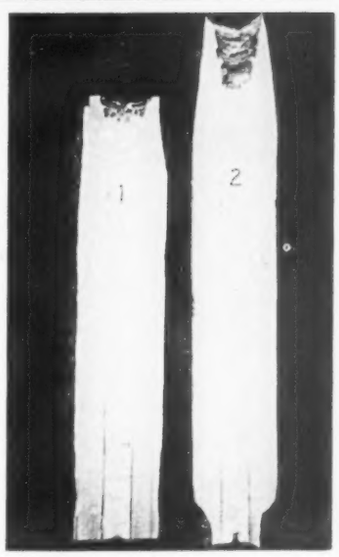
In operation the acid is drawn in opposite directions through the openings at the ends of the cross-branch, is heated by the central steam jet and returned to the body of the bath.

Longer life on the walls of tank and injector is secured as the heat and acid are evenly distributed. Hammering or chattering is largely eliminated and breakage of the injector (lead) is minimized.

Details gladly furnished.

DIETZEL LEAD BURNING COMPANY
Keystone Bldg. Pittsburgh, Pa.

Let LIQUITOL Reduce YOUR INGOT COSTS



(1) Is treated with LIQUITOL A SPECIAL, the fluid metal is only poured to half of the head. The formation of the hole is such that the ingot is quite solid. The savings in 16 of these ingots is 1 ingot. This is only used for refined steel, that is to say, tool steel, cutting steel, and special steels of high quality.

Liquitol is a scientifically prepared product resulting in sound Steel or Iron Castings. It retards cooling of hot top metal. Cavities and porosities practically eliminated.

Does not injure or affect physical or analytical properties of steel or cast iron.

Made in 4 grades for 4 purposes.

Ask for detailed bulletin AL-16-A.

THE ALPHA-LUX COMPANY, INC.
192 Front St.,
NEW YORK CITY

Branches
Philadelphia Chicago

nails, castings, sheet metal articles and novelties, by Maurice T. Cullerton, Edna Thompson and Lois Thompson. Correspondent: Louis Bennett, 7 South Dearborn street.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids Oct. 2, schedule 3298, on pumps, accessories and spare parts; schedule 3339 on motor-driven air compressors and spare parts.

Louisiana

LOGANSPORT, LA. — Charles D. Evans, Shreveport, La., is engineer for proposed waterworks system. Project includes sinking deep well, construction of pumping station, storage tank and distribution system extensions.

Maryland

BALTIMORE—Combs Distilling Corp., 10 Light street, has been chartered by Fred E. Lang, Dorothy M. Gaston and Robert N. Hanson.

TOOL STEEL
TUBING

NON-SHRINK
OIL HARDENING
NON-DEFORMING

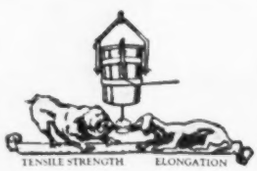
for RING DIES
CUTTING DIES
SPACERS, BUSHINGS, Etc.

Manufacturers of BISCO Tungsten Carbide drawing dies and cutting tools.

THE BISSETT STEEL COMPANY
945 E. 67th ST., CLEVELAND, OHIO
Cincinnati Philadelphia

Strong
STEEL CASTINGS

Acid Open-Hearth Steel



from 1 lb. to 30,000 lbs.

STRONG STEEL FOUNDRY CO.
BUFFALO, N. Y.

North Carolina

CAROLINA BEACH, N. C.—City, E. H. Bellamy, attorney, is planning to start work Oct. 1 on waterworks system to cost $50,000, including 100,000-gallon tank on 100-foot tower, pump and well with capacity of 150 gallons per minute.

ROANOKE RAPIDS, N. C.—Virginia Electric & Power Co., Richmond, Va., plans rebuilding burned portion of power plant here.

SANFORD, N. C.—Suggs Bros., Carthage, N. C., have purchased Moffitt Iron Works, Sanford, N. C., and will make repairs. Machinery repair plant operated by Suggs Bros. will be moved from Carthage to Sanford and will be combined with the Sanford plant.

South Carolina

BETHUNE, S. C.—City, C. C. Gardner, mayor, will open bids Sept. 26 for construction of waterworks, including installation of deep well pump, meters, etc., and 75,000-gallon elevated storage tank on 100-foot tower. Ryan Engineering Co., engineer, 41 Arcade building, Columbia, S. C.

PINEWOOD, S. C.—City, J. R. Richardson, clerk and treasurer, opens bids Sept. 25 for construction of waterworks system, consisting of pipe lines, valves, hydrants, meters, etc., and tank foundation, one deep well and one deep well pump and 75,000-gallon elevated storage tank on 100-foot tower. Ryan Engineering Co., engineer, 41 Arcade building, Columbia, S. C.

Tennessee

JAMESTOWN, TENN — Town has PWA grant and loan of $46,000 for constructing waterworks system.

TRIMBLE, TENN.—City will soon receive bids for waterworks improvement, including 250-gallon per minute motor-driven pump, 50,000-gallon steel tank on 100-foot tower, etc. T. Allen, engineer, 65 McCall building, Memphis, Tenn.

Virginia

BROADWAY, VA.—Town, J. P. Harpine, mayor, plans waterworks system. Loan and grant of $47,000 has been approved.

RICHMOND, VA.—Old Dixie Distilling Co., with temporary headquarters at Ruegers hotel, will complete plant and purchase necessary equipment. R. L. Mahley and J. C. Little are in charge of purchasing equipment.

Missouri

ST. LOUIS—Mississippi Valley Equipment Co., 511 Locust street, wants prices and data on construction and railroad equipment, power plant equipment, machinery and supplies, including gasoline-driven portable air compressor, and generators.

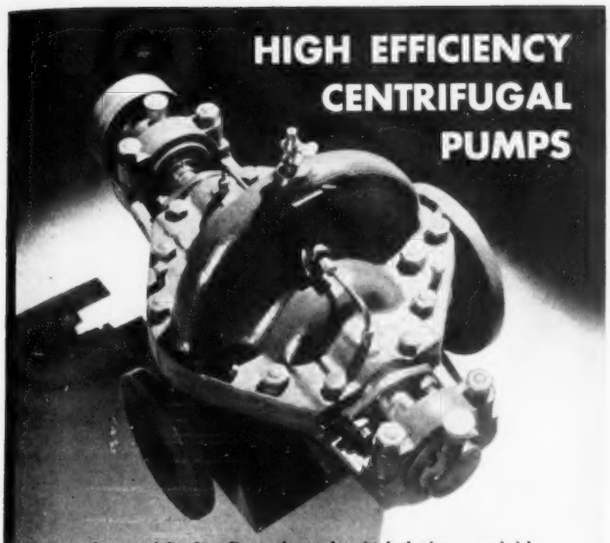
Oklahoma

CLINTON, OKLA.—City plans sewage disposal plant to cost $41,000. C. P. Smith, Clinton, Okla., engineer.

OKLAHOMA CITY, OKLA.—Steam Generator Service & Mfg. Co. has been incorporated to manufacture and distribute steam specialties, by Clyde S. Say, 1435 Southeast Twenty-ninth street.

TULSA, OKLA.—Oil Well Improve-

HIGH EFFICIENCY CENTRIFUGAL PUMPS



Advanced hydraulic and mechanical design . . . rigid manufacturing standards . . . based on a breadth of experience surpassed by none. RESULT . . . remarkable performance reported by users in every industry.

● *Descriptive literature available for a wide range of types and applications*

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: HARRISON, NEW JERSEY Branch Offices or Representatives in Principal Cities

WORTHINGTON

Save with Curtis Hoists

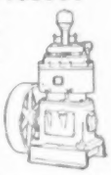
Illustrating
1 Air Powered Crane
2 Portable Hoist
3 Stationary Pendant Hoist
4 Movable Pendant Hoist

Save Money *on* First Cost *and* Operation

NO MATTER what the condition—if it's a hoist job—the chances are a Curtis will solve your problem. As a matter of fact, the worse the condition the better Curtis Air Hoists show up. They are so simple in construction—so "fool-proof" in operation—so impervious to corrosive and abrasive elements—that they do jobs other hoists can't touch, yet they are inexpensive. For instance—

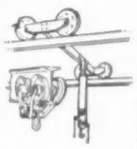
One man, a common laborer, can operate a Curtis skillfully—operating costs, including power, labor, depreciation and servicing, prove Curtis economy—when an over-load is applied, it simply won't lift; showing it's "fool-proof"—it will spot to a hair's breadth and lift or lower gently, showing perfect control—it pulls, or pushes or does both, showing it's flexible—steam, moisture, acid, fumes, grit, dust and exposure to weather have little or no effect—showing it's dependable.

Curtis Industrial Compressor



3 to 50 h. p. Capacity up to 250 cu. ft. per minute. Water-cooled, controlled splash lubrication, higher speeds, controlled temperature head, low oil consumption, less carbon precipitation. Unloader regulates air pressure. By-pass allows start against no load.

Curtis I Beam Air Crane



10 to 40 foot span, ½ to 10 ton capacity. Light, strong pressed steel construction, flexible roller bearings. Successfully operated by any workman in combination with Curtis Hoists and I Beam Trolley. Easy-running, strong and safe.

Curtis Air Hoists cost only ⅕ the price of ordinary power hoists, or little more than a chainblock. If you've a hoist job you want done, investigate Curtis Air Hoists before you buy.

Curtis Pneumatic Machinery Company, 1996 Kienlen Ave., St. Louis, Mo., 5518 A J Hudson Terminal, New York City

CURTIS

NRA MEMBER U.S. WE DO OUR PART

COMPRESSORS—AIR HOISTS
I-BEAM CRANES and TROLLEYS

NIAGARA
BRAND
FERRO-ALLOYS

FERRO-SILICON
ALL GRADES

FERRO-CHROMIUM
HIGH CARBON

FERRO-CHROMIUM
LOW CARBON

FERRO-MANGANESE

SILICO-MANGANESE

Always
DEPENDABLE, UNIFORM,
SUPERIOR

PITTSBURGH METALLURGICAL COMPANY, INCORPORATED
NIAGARA FALLS, NEW YORK

ment Co., pioneer manufacturer of oil field drilling equipment, was recently incorporated with capital of $250,000. Alf. G. Heggem is president and general manager.

Texas

GLADEWATER, TEX.—C. L. & W. Refining Co. has been incorporated to operate an oil refinery, by Nathan Lynch, president.

GLADEWATER, TEX.—Wabash Refining Co. has been incorporated with capital of $20,000 to build an oil refinery, by R. W. Porter, president.

KILGORE, TEX.—Roco Refining Co. has been incorporated with $18,000 to build and operate an oil refinery. L. B. Cohen is president.

NAPLES, TEX.—City, H. R. F. Helland, San Antonio, consulting engineer, will open bids soon for $45,300 waterworks, including 50,000-gallon elevated tank and tower, and pump station.

SAVOY, TEX.—Town, Charles E. Haydon, consulting engineer, Professional building, Denison, Tex., will expend about $21,000 for waterworks improvements, including installation of deep well pump, direct pressure pump and natural gas engine.

THREE RIVERS, TEX.—City has loan and grant of $26,000 for waterworks improvements, consisting of elevated tank and tower, and water softening plant. Will soon call for bids. A. A. Ririe, engineer, 622 East Woodlawn avenue, San Antonio, Tex.

Minnesota

MINNEAPOLIS — Jeffery-Quest Foundry Co., J. F. Quest, president, 900 South Fourth street, has awarded contract to Runyon Building Service Co. for construction of a 1-story addition to its plant.

MINNEAPOLIS—Tankar Gas Inc., 2504 Foshay Tower, Karl T. Wiedemann, president, has started construction of a bulk gasoline plant, garage, etc., at 3631 West Lake street, to cost $40,000, including three 100,000-gallon, one 200,000-gallon and one 34,000-gallon tank.

Iowa

BURLINGTON, IOWA — Burlington Brewing Co., D. G. Thompson, president, has awarded contract to Frick Co. Inc., Waynesboro, Pa., to furnish refrigerating machinery. Contracts will be let shortly for other brewery equipment and machinery. George E. Wells Co. Inc., St. Louis, is architect and engineer.

DES MOINES, IOWA—Yellow Cab Co. is in the market for a threshing engine boiler, or similar small horizontal return tube boiler, also for a tool post grinder for lathe.

ESTHERVILLE, IOWA—City council has voted to take bids for a diesel unit for the municipal light plant. Diesel unit to be 750 horsepower. R. O. Clark is city clerk.

Montana

GLENDIVE, MONT.—August Colin, city clerk, will receive bids until Oct. 1 for improvements and equipment for municipal water plant, including one sludge pump, one recarbonation equipment unit, one well with pumping equipment and rate of flow controller.

GREAT FALLS, MONT.—Great Falls Breweries Inc. has awarded contract to Ferche & Karaffa for construction of a 24 x 61-foot addition to the brewery plant, and also for remodeling work in the malting plant.

Utah

MURRAY CITY, UTAH—City is preparing plans and specifications for PWA loans and grant in the amount of $33,000 for installation of a new diesel generating unit at the Murray City hydroelectric plant. The diesel generating unit will be 312 kilowatt-amperes at 4800 feet elevation, and will be complete with all auxiliaries, fuel tanks, spray pond, etc.

Pacific Coast

COULEE, WASH.—Silas Mason Co., contractor for the Coulee dam, will receive bids shortly for constructing 320 dwellings and other structures, including warehouse, shops, stores, mess depots, etc.

SHELTON, WASH.—By a vote of 702 to 323, citizens have rejected a $100,000 bond issue to purchase the distributing system of the West Coast Power Co.

Consider Good Used Equipment First

***For* DIE CASTING — FORGING INDUSTRY — MACHINE SHOPS — POWER PLANTS — ROLLING MILLS — STAMPING and ALLIED INDUSTRIES STRUCTURAL, BOILER and TANK INDUSTRY**

AIR COMPRESSOR—170 cu. ft. 8 1/2 x 9" WORTHINGTON belt driven Air Compressor. Feather valves. Air unloader and cylinder lubricator. Also air receiver, endless double leather belt and motor of any desired current if required.

BENDING ROLLS—10' 2" BELOIT Plate Bending Rolls. Pyramid Type. Top roll 8 1/2" diameter, bottom rolls 7" diameter. Drop end housing. Capacity 1/4" plate for full length of rolls. Top roll raises and lowers by hand. Machine driven by a 7 1/2 H.P., 440 volt, 3 phase, 60 cycle Fairbanks Morse slip ring motor. Complete with drum controller and grids for reversing control. Approx. wgt. 10,200 lbs.

BORING MILL—BETTS 10' Swing Vertical Boring Mill, with 20 H.P. & 5 H.P. Motors offered at $3,000.00 net.

CORRUGATING ROLL—12' POORMAN Corrugating Roll. Belt or Motor Drive. Rolls 24" diameter. Designed for interchangeable dies. Now fitted with die plates with 1 1/4" centers and 2 1/2" centers. Approx. wgt. 50,000 lbs.

CRANE—15 Ton ERIE Overhead Electric Traveling Crane. 62' Span, 25' Lift, (3) Motors 220 v., 3 ph., 60 cy., A.C.

DRILL—5' CINCINNATI-BICKFORD Radial Drill. Motor drive with A.C. motor and starter.

FORGING MACHINE—2" Steel Frame, Single Geared, AJAX Forging Machine. Arranged for belt or motor drive.

GRINDERS—KELLER R-6 Universal Radius and Cutter Grinder. 156" HYDE PARK Shear Knife Grinder. Grinding wheel 26" diameter sectional. Circulating Pump. Direct connected motor drive. Power feed and traverse.

HEADER—No. 2 MANVILLE Rod Heading machine. Single Stroke. Open die cold header. Capacity 5/16" x 4". Approx. wgt. 6,525 lbs.

LATHES—No. 3 NILES-BEMENT-POND Geared Motor Drive AXLE Lathe with A.C. motor. 30" Swing, 14' Bed.

26" x 16' BRIDGEFORD, Geared Head. Single Pulley drive with taper attachment.

PLANER—96" x 96" x 14' POND Four Head, Heavy Duty, 50 H.P. Motor drive.

PUNCH—12' BERTSCH Multiple or Gang Punch. Capacity 73—3/8" holes through No. 10 gauge plate on 2" centers. 25 strokes per minute. Will take up to 9 16" punches and dies. Length of stroke 3". Depth of Throat 7".

PRESSES—300-Ton NILES-BEMENT-POND Hydraulic, 48" bet. parallel bars with Triplex Pump.

No. 12 BLISS Straight Side, Double Crank, Double Geared, Single Action. 14" stroke. Bed area 52 x 84". Shaft dia. 12" at bearings; 13" at pins. Arranged for M.D. and motor adjustment. Wgt. 200,000 lbs.

No. 6 1/2 BLISS Straight Side Press. 54" bet. uprights. Dbl. Crank with spring counterbalance for slide. Stroke 8". Shaft 6 1/2" diameter at cranks, 7 1/2" dia. at pins. Single geared. Approx. wgt. 33,500 lbs.

SHAPER—32" COLUMBIA Heavy Duty Crank Shaper, back geared. Arranged for motor drive, quick change gear speed box, swivel vise on table with jaws 16" wide. Hole under ram for key seating.

SHEAR—10' OHL Power Squaring Shear with brackets, gauge and all regular accessory parts for a complete machine.

No. 10 BUFFALO Armor Plate Special Bar Cutter for cutting bars and shearing plates and shapes. Cap. rounds 3 7/8", Squares, 3 1/2" Angles, 8" x 3/4". Flats 8" x 1 1/4". Tees, 6" x 3/4". Beams, 12"—31 1/2 lbs. Channels 12"—25 lbs. Number of strokes 20. Approx. wgt. 16,500 lbs. Geared motor drive.

5—12' 6" HYDE PARK Power Squaring Shears. Motor drive with or without motors. 16" gap. Cap. to shear 1/4", 5/16" and 3/8" plate, table 23" wide, 14' 3" long. Extra set of shear blades with each machine.

SLITTER—36" YODER Size G — Gang Slitting and Levelling machine, belt or motor drive. Cap. 15 cuts up to No. 16 gauge, 11 cuts—No. 14 gauge, 5 sets of cutters. Wgt. 5,000 lbs.

STRAIGHTENER AND CUTTING OFF MACHINE—No. 1 SHUSTER for strip metal or rounds, now equipped with rolls and tool for strip metal 1 1/4" wide by 1/8" thick. Driven by a 5 H.P., 220 volt, 60 cycle, 3 phase, A.C. motor.

TESTING MACHINE—150,000 lb. TINIUS OLSEN UNIVERSAL Screw Power Testing Machine. Three rotating screw type. Belt or motor drive. Dial vernier screw beam. Complete set of grips.

—Equipment Available For Practically Any Type Of Manufacturing Requirement—

Manufacturing RITTERBUSH & COMPANY, INC. *Equipment*

30 CHURCH ST.
NEW YORK CITY

Pittsburgh Office
710 Park Bldg.

Telephones Cortlandt 7-3437—3438

Pittsburgh Phone
Atlantic 1208

Confidential Certified Appraisals—Consulting Engineering Service—Liquidations
Bona Fide Auction Sales Arranged—Entire or Surplus Mfg. Equipment Inventories Purchased